1909phae.proj.2302B

Vol. IX

Positions
of
Nebulae

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1969phae.proj..23028

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A 7497 No. 1 Sept. 29, 1909

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | 21 49 39.7 | | -49 59.6 |
| b = -49 11522 | 21 49 57.8 | -49 55.8 | -118.8 = | 21 47 58.8 | +11.8 = | -50 6.8 |
| a = -50 11623 | 21 45 15.5 | -50 20.0 | +165.3 = | 21 48 2.8 | +13.5 = | -50 6.5 |
| c = -50 1162 | 21 44 47.8 | -50 55.8 | | 21 48 1.8 | | -50 6.7 |

c − a = − 5.6      −1.1 +1.2      +0.1 −0.1

cos −50.9 / 2    .315

− 1.8

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 110.5 | 25.0 | 120.0 |
| b | 110.3 | 159.4 | 115.4 | 168.7 |
| n | 72.5 | 137.3 | 77.6 | 146.7 |

| x | x | y | y |
|---|---|---|---|
| n-a +52.5 | n-b −37.8 | n-a +26.8 | n-b −22.1 |
| +52.6 | −37.8 | +26.7 | −22.0 |
| +52.55 | −37.8 | +26.75 | −22.05 |
| +53.07 | −38.18 | +27.02 | −22.27 |
| ÷ .321 | ÷ .321 | +13.51 | −11.14 |
| +165.3 | −118.9 | | |
| ✓ | ✓ | | |

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# A 7497 No. 2 Sept. 29, 1909

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fno. | 21 | 32 | 19.7 | -50 | 3.7 |
| b | | | | | | | | | | | |
| a | -50 | 11582 | 21 | 30 | 50.0 | -50 | 12.7 | + | 38.8 = | 21 30 39.9 | + 2.4 = | -50 | 10.3 |
| a | | | | | | | | | | | | | |
| b | -49 | 11452 | 21 | 28 | 49.2 | -49 | 10.8 | + | 38.5 = | 21 30 17.7 | - 17.7 = | -50 | 10.3 |
| | | | | | | | | | 77.3 | | | | |
| P | -51 | 11700 | 21 | 29 | 39.2 | -51 | 19.0 | | | 21 30 38.0 | | -50 | 10.4 |
| | | | | | | x | | | | | | | |
| | | | | | | 19.0 | | | | | | | |
| | | | c − a = | | | +50.0 | | | | −0.5 | +0.5 | 0.0 | 0.0 |

$\frac{C_{00} = +51.3}{2}$

.313
5.9
+25.6

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 181.8 | 25.0 | 186.2 |
| b | 50.8 | 143.8 | 55.9 | 148.2 |
| η | 46.6 | 148.2 | 51.7 | 152.6 |

error in the identification of star "a"

| x | x | y | y |
|---|---|---|---|
| η-a + 26.6 | η-b − 4.4 | η-a −33.6 | η-b + 4.4 |
| + 26.7 | − 4.2 | − 33.6 | + 4.4 |
| + 26.7 | − 4.2 | − 33.6 | + 4.4 |
| + 26.97 | − 4.24 | −33.94 | + 4.44 |
| ÷ .324 | ÷ .324 | − 16.97 | + 2.22 |
| + 83.3 | − 13.1 | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 177.5 | 25.0 | 185.0 |
| b | 48.6 | 137.7 | 53.7 | 145.3 |
| η | 44.8 | 157.8 | 49.8 | 150.0 |

| x | x | y | y |
|---|---|---|---|
| η-a + 24.8 | η-b − 3.8 | η-a − 35.0 | η-b + 4.8 |
| + 25.005 | − 3.84 | − 35.0 | + 4.7 |
| + 25.8 | − 3.85 | − 35.0 | + 4.75 |
| + 25.005 | − 3.89 | − 35.35 | + 4.80 |
| ÷ .321 | ÷ .321 | − 17.68 | + 2.40 |
| + 78.0 | − 12.1 | | |

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# A 7497 No. 3. Sept. 29, 1909.

1900 pos. 21 27 55.5 − 50 9.2

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| a [b] = −50 11576 | 21 26 31.5 | −50 20.4 | −18.4 [2] = | 21 26 13.4 [2.9] | + 4.7 = | −50 15.7 | |
| b [a] = −49 11437 | 21 25 8.2 | −49 54.0 | +65.3 [4.7] = | 21 26 13.5 [4.1] | −2.4 [1.9] = | −50 16.4 [5.9] | |
| c = −51 11685 | 21 25 27.2 | −51 3.9 | | 21 26 13.5 [5] | | −50 15.9 [8] | |

x

c − a = + 19.0   − 0.6 + 0.6   − 0.1 + 0.1

cos −51.0 / 2   .315

+ 6.0

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 178.4 | 25.0 | 169.9 |
| b | 46.6 | 125.4 | 51.6 | 117.0 |
| n | 40.7 | 134.7 | 45.8 | 126.2 |

| | x | | x | | y | | y |
|---|---|---|---|---|---|---|---|
| n−a | + 20.7 | n−b | − 5.9 | n−a | − 43.7 | n−b | + 9.3 |
| | + 20.8 | | − 5.8 | | − 43.7 | | + 9.2 |
| | + 20.75 | | − 5.85 | | − 43.7 | | + 9.25 |
| | + 20.96 | | − 5.91 | | − 44.14 | | + 9.34 |
| | ÷ .321 | | ÷ .321 | | − 22.07 | | + 4.67 |
| | + 65.3 | | − 18.4 | | | | |
| | ✓ | | ✓ | | | | |

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1909phae.proj.2302B



# A7497 No. 4 Sept. 29, 1909

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 prec. | 21 | 41 | 16.3 | −50 | 12.9 |
| a. | −50 | 11605 | 21 | 39 | 23.0 | −50 | 24.4 | + 14.$^{0}$X = | 21 | 39 | 37.$^{0}$X + 4.7 = | −50 | 19.7 |
| b. | −50 | 11609 | 21 | 40 | 19.5 | −50 | 7.9 | − 44.$^{0.9}$X = | 21 | 39 | 35.$^{6}$X − 1.$^{9}$20 = | −50 | 19.$^{8}$X |
| c. | −51 | 11735 | 21 | 39 | 24.2 | −51 | 11.6 | | 21 | 39 | 36.$^{3}$X | −50 | 19.8 |
| | | | | | X | | | | | | | | |
| | | | c − a = + 1.2 | | | | | | | | + 0.7 −0.7 | | − 0.1 0.0 |

Cor − 51.2 / 2

.313

+ 0.4

| | x | y | x | y |
|---|---|---|---|---|
| a | 30.0 | 135.3 | 35.0 | 145.$^{4}$6 |
| b | 47.5 | 168.3 | 52.5 | 197.5 |
| n | 34.5 | 144.6 | 39.4 | 153.8 |

| | x | x | y | y |
|---|---|---|---|---|
| n-a | + 4.5 n-b | − 13.0 n-a | + 9.3 n-b | − 23.7 |
| | + 4.4 | − 13.1 | + 9.2 | − 23.7 |
| | + 4.45 | − 13.05 | + 9.25 | − 23.7 |
| | + 4.49 | − 13.18 | + 9.34 | − 23.94 |
| | ÷ .319 | ÷ .319 | + 4.67 | − 11.97 |
| | + 14.1 | − 41.3 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 5 Sept. 29, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 21 | 33 | 54.4 | -50 | 15.3 |
| a = | -50 11584 | 21 | 32 | 0.5 | -50 | 33.8 | +13.8 | = 21 | 32 | 13.8 | +11.8 | = -50 | 25.6 |
| b = | -50 11585 | 21 | 32 | 22.5 | -50 | 11.2 | -10.5 | = 21 | 32 | 12.0 | -1.0 | = -50 | 22.2 |
| c = | -51 11710 | 21 | 33 | 3.2 | -51 | 26.2 | | 21 | 32 | 12.9 | | -50 | 22.0 |

x

c - b = + 4.07

Cos -51.4 / 2

.312

+ 12.7

+0.8 -0.8 | -0.0 +0.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 22.5 | 132.0 | 27.5 | 137.3 |
| b | 30.0 | 177.2 | 35.0 | 182.6 |
| η | 26.7 | 155.5 | 31.7 | 160.8 |

| x | x | y | y |
|---|---|---|---|
| η - a | + 4.2 | η - b | - 3.3 | η - a | + 23.5 | η - b | - 21.7 |
| | + 4.2 | | - 3.3 | | + 23.5 | | - 21.8 |
| | + 4.2 | | - 3.3 | | + 23.5 | | - 21.75 |
| | + 4.24 | | - 3.33 | | + 23.74 | | - 21.97 |
| | ÷ .319 | | ÷ .319 | | + 11.87 | | - 10.98 |
| | + 13.3 | | - 10.5 | | | | |
| | v | | v | | | | |

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1909phae.proj.2302B



# A 7497 No. 6 Sept. 29, 1909

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | 1900 fws. 21 33 9.3 | −50 | 23.9 |
| a = −50 | 11581 | 21 29 29.0 | −50 | 26.0 + 11 8.2 4 = 21 31 2 7.2 4 − 4.6 = | −50 | 30.6 |
| b = −50 | 11588 | 21 33 59.5 | −50 | 39.5 − 15 1.6 = 21 31 2 8.4 + 9.0 = | −50 | 30.5 4 |
| C = −51 | 11700 | 21 29 39.2 | −51 | 19.0 | 21 31 27.8 | −50° 30'.6 |

×

C − a = + 10.2

−0.6 +0.6 0.0 −0.1

$\frac{C+a-51.3}{2}$

·313

+3.2

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 163.5 | 20.0 | 179.0 |
| b | 100.8 7 | 13 6.4 4 | 105.6 | 151.8 |
| m | 52.4 6 | 154.3 3 | 57.6 | 169.8 |

| x | x | y | y |
|---|---|---|---|
| m − a + 37.6 | m − b − 48.1 | m − a − 9.2 | m − b + 17.9 |
| + 37.6 | − 48.0 | − 9.2 | + 18.0 |
| + 37.6 | − 48.05 | − 9.2 | + 17.95 |
| + 37.98 | − 48.53 | − 9.29 | + 18.13 |
| ÷ .318 | ÷ .318 | − 4.64 | + 9.06 |
| + 119.4 | − 152.6 | | |
| √ | √ | | |

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# A 7497 No. 7 Sept. 29, 1909

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 | pro. | 21 | 28 | 47.6 | −50 | 22.8 |
| a | −50 | 11572 | 21 | 25 | 17.6 | −50 | 32.2 | +108.4 | = | 21 | 27 | 4.3 / 4.9 | +3.0 | = −50 | 29.2 |
| b | −50 | 11578 | 21 | 38 | 16.5 | −50 | 38.8 | −71.6 | = | 21 | 27 | 0.9 / 5.6 | −0.7 | = −50 | 29.5 |
| c | −51 | 11696 | 21 | 38 | 8.7 | −51 | 23.7 | | | 21 | 27 | 5.2 | | −50 | 29.4 |

x

c − b = − 7.8

−0.3 +0.4 −0.2 +0.1

$\frac{c_{00} - 51.4}{2}$

.312

− 2.4

| | x | y | x | y |
|---|---|---|---|---|
| a | 18.3 | 141.8 | 23.3 | 151.3 |
| b | 75.0 | 149.2 | 80.0 | 158.8 |
| n | 52.4 | 147.8 | 57.5 | 157.3 |

| x | x | y | y |
|---|---|---|---|
| n − a + 34.1 | n − b − 22.6 | n − a + 6.0 | n − b − 1.4 |
| + 34.2 | − 22.5 | + 6.0 | − 1.5 |
| + 34.15 | − 22.55 | + 6.0 | − 1.45 |
| + 34.49 | − 22.77 | + 6.06 | − 1.46 |
| ÷ .318 | ÷ .318 | + 3.03 | − 0.73 |
| + 108.4 | − 71.6 | | |
| √ | √ | | |

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# A 7497 No. 8 Sept. 29, 1909

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fus. | 21 | 27 | 31.5 | −50 28.1 |
| a = | −50 | 11569 | 21 | 24 | 40.6 | −50 | 32.2 | +68.8 | = 21 | 25 | 48.4 −2.4 = −50 34.6 |
| b = | −50 | 11577 | 21 | 27 | 59.5 | −50 | 40.5 | −130.9 | = 21 | 25 | 48.4 +5.7 = −50 34.8 |
| c = | −51 | 11696 | 21 | 28 | 8.7 | −51 | 23.7 | | | 21 | 25 49.3 −50 34.8 |

Cos −51.4

c − b = + 9.2
.312
+ 2.9

−0.6 +0.6 −0.2 +0.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 27.3 | 146.5 | 32.3 | 154.1 |
| b | 90.0 | 130.4 | 95.0 | 138.0 |
| n | 48.9 | 141.6 | 53.9 | 149.3 |

| x | x | y | y |
|---|---|---|---|
| n−a + 21.6 | n−b − 41.1 | n−a − 4.9 | n−b + 11.2 |
| + 21.6 | − 41.1 | − 4.8 | + 11.3 |
| + 21.6 | − 41.1 | − 4.85 | + 11.25 |
| + 21.82 | − 41.51 | − 4.90 | + 11.36 |
| ÷ .318 | ÷ 318 | − 2.45 | + 5.68 |
| + 68.8 | − 130.9 | | |
| ✓ | ✓ | | |

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# A 7497 No. 9 Sept. 29, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 jus. | 21 | 39 | 25.4 | −50 | 42.5 |
| b | −50 | 11602 | 21 | 38 | 54.5 | −50 | 45.7 | = 21 | 39 | −3.6 | = −50 | 49.3 |
| a | −50 | 11598 | 21 | 37 | 17.5 | −50 | 51.5 | = 21 | 37 | +2.2 | = −50 | 49.3 |
| c | −51 | 11730 | 21 | 37 | 52.2 | −51 | 38.4 | | 21 | 37 | −50° | 49.3 |
| | | | | | | | | | | | | |
| | | | | | c − a = | | +34.7 | | | +1.0 −1.0 | 0.0 | 0.0 |
| | | | | | | | .310 | | | | | |
| | | | | | | | +10.8 | | | | | |

$\frac{C_{00} - 51.6}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 35.0 | 127.7 | 20.0 | 117.0 |
| b | 66.3 | 138.2 | 51.3 | 128.6 |
| η | 48.9 | 131.0 | 38.9 | 121.4 |

| | x | x | y | y |
|---|---|---|---|---|
| η − | + 8.9 | m − a − 22.4 | m − b + 4.4 | − 7.2 |
| | + 8.9 | − 22.4 | + 4.35 | − 7.2 |
| | + 8.99 | − 22.62 | + 4.39 | − 7.27 |
| | ÷ .316 | ÷ .316 | + 2.195 | − 3.64 |
| | + 28.4 | − 71.6 | | |
| | ✓ | ✓ | | |

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A 7497 No. 10 Sept. 29, 1909

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 1900 fm. | 21 38 9.9 | -50 | 39.1 |
| a | -50 | 11593 | 21 36 8.0 | -50 | 49.0 | + 21.2 = 21 36 29.2 + 2.8 | = -50 | 46.2 |
| b | -50 | 11605 | 21 39 23.0 | -50 | 24.4 | -176.0 = 21 36 28.8 - 22.2 | = -50 | 46.6 |
| c | -50 | 11721 | 21 36 8.7 | -51 | 32.8 | | 21 36 28.9 | -50 46.4 |

x

c - a = + 0.7

.311

+ 0.2

+0.1 -0.1 -0.1 +0.1

$\frac{c_{00} - 51.6}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 30.0 | 121.8 | 35.0 | 130.1 |
| b | 91.8 | 171.5 | 97.0 | 179.7 |
| n | 36.6 | 127.4 | 41.8 | 135.7 |

| | x | x | y | y |
|---|---|---|---|---|
| n-a | +6.6 | n-b -55.2 | n-a +5.6 | n-b -44.1 |
| | +6.7 | -55.3 | +5.6 | -44.0 |
| | +6.65 | -55.25 | +5.6 | -44.05 |
| | +6.72 | -55.80 | +5.66 | -44.49 |
| | ÷.317 | ÷.317 | +2.83 | -22.24 |
| | +21.2 | -176.0 | | |

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A 8497 No. 11 Sept. 29, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 Jno. | 21 36 | 55.1 | -50 38.1 |
| a | -50 11588 | 21 33 59.5 | -50 39.5 | +74.9 | = | 21 35 14.4 | -5.5 | = | -50 45.0 | |
| b | -50 11593 | 21 36 8.0 | -50 49.0 | -53.9 | = | 21 35 14.1 | +4.1 | = | -50 44.9 | |
| c | -51 11718 | 21 37 22.7 | -51 40.5 | | | 21 35 14.3 | | | -50 44.9 | |
| | | | c − a = | +13.2 | | | | −0.5 | +0.5 | 0.0 0.0 |

$\frac{c_{00} - 51.7}{2}$ .310 + 7.2

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 139.1 | 25.0 | 149.6 |
| b | 60.3 | 120.1 | 65.4 | 130.6 |
| η | 43.5 | 138.3 | 48.5 | 138.8 |

| x | x | y | y |
|---|---|---|---|
| η − a +23.5 | η − b −16.8 | η − a −10.8 | η − b +8.2 |
| +23.5 | −16.9 | −10.8 | +8.2 |
| +23.5 | −16.9 | −10.8 | +8.2 |
| +23.74 | −17.07 | −10.91 | +8.28 |
| ÷ .317 | ÷ .317 | −5.46 | +4.14 |
| +74.9 | −53.9 | | |

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See page 106 for Neb. #12a?
mostly by R. Curtis.

# A 7497 No. 12 Sept. 29, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 prec. | 21 | 37 | 4.0 | −50 | 45.6 |
| a. | −50 | 11588 | 21 | 33 | 59.5 | −50 | 39.5 | + 83.1 × 2.3 = | 21 | 35 | 22.8 − 12.8 = | −50 | 52.3 |
| b. | −56 | 11727 | 21 | 37 | 4.2 | −51 | 10.2 | − 101.3 × 3 = | 21 | 35 | 22.9 + 18.9 = | −50 | 52.4 |
| c. | −51 | 11718 | 21 | 34 | 22.7 | −51 | 40.5 | | 21 | 35 | 22.8 | −50 | 52.5 |
| | | | | | | | | | | | | | |
| | | | | | | | c − a = | + 23.2 | | | − 1.0 + 1.1 | −0.1 | 0.0 |

$\frac{c+a}{2} = -51.7$

.310

+ 7.2

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 165.0 | 15.0 | 155.4 |
| b | 77.5 | 103.8 | 72.5 | 94.2 |
| n | 45.9 | 139.4 | 40.9 | 129.8 |

| x | x | y | y |
|---|---|---|---|
| n − a + 25.9 | n − b − 31.6 | n − a − 25.6 | n − b + 35.6 |
| + 25.9 | − 31.6 | − 25.6 | + 35.6 |
| + 25.9 | − 31.6 | − 25.6 | + 35.6 |
| + 26.16 | − 31.92 | − 25.86 | + 35.96 |
| ÷ .315 | ÷ .315 | − 12.93 | + 17.98 |
| + 83.1 | − 101.3 | | |
| ✓ | ✓ | | |

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A 7497 No. 13 Sept. 29, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 Jno. | 21 | 37 | 37.3 | −50 52.4 |
| a = −51 11714 | 21 | 34 | 11.7 | −51 | 10.2 | + 104.0 | = 21 | 35 | + 10.7 | = −50 59.1 |
| b = −50 11598 | 21 | 37 | 17.5 | −50 | 57.5 | − 7.4 | = 21 | 35 | − 7.4 | = −50 59.1 |
| c = −52 11920 | 21 | 34 | 38.1 | −52 | 0.9 | | | 21 35 56.1 | | −50° 59.2 |
| | | | c − a = + 26.4 | | | | | −0.4 +0.4 | | −0.1 0.0 |

$\frac{c - a}{2}$ = 13.2 × .308 = 4.1 + 5.0

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 119.8 | 25.0 | 131.6 |
| b | 78.5 | 155.7 | 84.4 | 167.6 |
| η | 58.4 | 142.0 | 58.4 | 157.8 |

| x | x | y | y |
|---|---|---|---|
| n − a + 38.4 | m − b − 25.0 | n − a + 21.2 | m − b − 14.8 |
| + 38.4 | − 26.0 | + 21.2 | − 14.8 |
| + 38.4 | − 25.25 | + 21.2 | − 14.75 |
| + 33.03 | − 24.75 | + 21.42 | − 14.60 |
| ÷ .315 | ÷ .315 | + 10.70 | − 7.45 |
| + 105.0 | − 81.8 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 14 Sept. 29, 1909

| | | | | | | 1900 fno. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| a = -50 11557 | 21 21 10.6 | -50 53.3 | +132.6 | = | 21 23 | 25 | 6.0 | -50 | 52.1 |
| b = -51 11685 | 21 25 27.2 | -51 3.9 | -134.4 | = | 21 23 | 29 | 5.1 | -50 | 58.8 |
| c = -51 11686 | 21 25 28.2 | -51 51.2 | | | 21 23 | 23.0 | | -50 | 58.7 |
| | x | | | | | | | | |
| c - b = +1.0 | | | | | -1.1 | +1.0 | | -0.2 | +0.2 |

$\frac{c_{00} - 51.8}{2}$

.309

+ 0.3

| | x | y | x | y |
|---|---|---|---|---|
| a | 9.9 | 150.5 | 19.8 | 160.9 |
| b | 90.0 | 129.9 | 85.0 | 145.5 |
| n | 51.2 | 140.0 | 61.2 | 150.5 |
| | x | x | y | y |
| n-a | +41.3 | n-b -38.8 | n-a -10.5 | n-b +10.1 |
| | +41.4 | -38.8 | -10.4 | +10.0 |
| | +41.35 | -38.8 | -10.44 | +10.05 |
| | +41.76 | -39.19 | -10.54 | +10.16 |
| | ÷.315 | ÷.315 | -5.27 | +5.08 |
| | +132.6 | -134.4 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



# A 7497 No. 15. Sept. 29, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fm. | 21 | 24 | 17.2 | −50 | 51.3 |
| a. | −50 | 11557 | 21 | 21 | 10.6 | −50 | 53.3 | +83.4 | = 21 | 22 | 33.8 | −4.4 | = −50 57.7 |
| b. | −51 | 11685 | 21 | 25 | 27.2 | −51 | 3.9 | −173.6 | = 21 | 22 | 33.6 | +6.6 | = −50 57.8 |
| c. | −51 | 11686 | 21 | 25 | 28.2 | −51 | 51.2 | | | 21 | 22 | 33.8 | −50 57.8 |

c − b = +1.0 | −1.0 | +1.1 | −0.1 | +0.2

c∞ −51.8 / 2

.309

+0.3

| | x | y | x | y |
|---|---|---|---|---|
| a | 9.9 | 150.5 | 19.8 | 160.9 |
| b | 90.0 | 179.9 | 95.0 | 145.5 |
| η | 35.9 | 141.8 | 46.8 | 152.2 |

| | x | x | y | y |
|---|---|---|---|---|
| η−a | +26.0 | η−b −54.1 | η−a −8.7 | η−b +11.9 |
| | +26.0 | −54.2 | −8.7 | +11.7 |
| | +26.0 | −54.15 | −8.7 | +11.8 |
| | +26.26 | −54.69 | −8.79 | +11.92 |
| | ÷ .315 | ÷ .315 | −4.395 | +5.96 |
| | +83.4 | −173.6 | | |
| | √ | √ | | |

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1909phae.proj.2302B

A 7497 No. 16 Sept. 29, 1909

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | 1900 pos. 21 23 23.8 | −50 51.8 |
| a = −50 | 11555 | 21 20 41.6 | −50 51.5 | +56.8 | = 21 21 38.4 | −6.8 | = −50 58.3 |
| b = −51 | 11679 | 21 24 7.7 | −51 15.4 | −144.9 | = 21 21 42.8 | +17.1 | = −50 58.3 |
| c = −51 | 11672 | 21 20 42.9 | −51 39.0 | | 21 21 40.6 | | −50 58.3 |

x

c − a = +1.3 −2.2 +2.2 0.0 0.0

cos −51.6 / 2

.310

+0.4

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 155.5 | 25.0 | 163.8 |
| b | 83.5 | 107.5 | 88.5 | 115.8 |
| n | 37.8 | 141.8 | 42.9 | 150.1 |

| x | x | y | y |
|---|---|---|---|
| n−a +17.8 | n−b ∓45.7 | n−a −13.7 | n−b +34.3 |
| +17.9 | −45.6 | −13.7 | +34.3 |
| +17.9 | −45.65 | −13.7 | +34.3 |
| +18.08 | −46.11 | −13.84 | +34.64 |
| ÷ .315 | ÷ .315 | −6.92 | +17.32 |
| +57.4 | −146.4 | | |

✓ ✓

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1909phae.proj.2302B



# A 7497 No. 17, Sept. 29, 1909

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fm. | 21 | 20 | 4.5 | −50 | 44.0 |
| a | −50 | 11545 | 21 | 17 | 8.1 | −50 | 44.5 | + 75.4 = | 21 | 18 | 22.7 | − 5.8 = | −50 | 50.2 |
| b | −51 | 11671 | 21 | 20 | 42.5 | −51 | 1.9 | − 144.0 = | 21 | 18 | 22.8 | + 11.3 = | −50 | 50.6 |
| c | −52 | 11883 | 21 | 20 | 40.3 | −52 | 17.8 | 14.6 | | | | | | |
| | | | | | | | | | 21 | 18 | 21.0 | | −50° | 50'.4 |
| | | | | | | | | | | | 21.3 | | | |
| | | | | | | | | | | | 21.0 | | | |
| | | | | | c − b = − 2.2 | | | | + 1.4 − 1.4 | | | | − 0.2 | + 0.3 |
| | | | | | .306 | | | | + 17 − 11 | | | | | |
| | | | | | − 0.7 | | | | | | | | | |

Cor. −52.3 / 2

| | x | y | x | y |
|---|---|---|---|---|
| a | 16.6 | 181.0 | 21.6 | 186.2 |
| b | 85.0 | 147.3 | 90.0 | 152.4 |
| η | 40.1 | 169.6 | 45.1 | 174.8 |
| | x | x | y | y |
| | η − a + 23.5 | η − b − 44.9 | η − a − 11.4 | η − b + 22.3 |
| | + 23.5 | − 44.9 | − 11.4 | + 22.4 |
| | + 23.5 | − 44.9 | − 11.4 | + 22.35 |
| | + 23.74 | − 45.35 | − 11.51 | + 22.57 |
| | ÷ 31.5 | ÷ 31.5 | − 5.76 | + 11.28 |
| | + 75.4 | − 144.0 | | |
| | + 75.4 | − 144.0 | | |

Note – In checking this comp. denote diff. in Dec. of star a – as given in cat. 34.5" – should be 44.5" – Correction in front of cat. U.S.N.O.

For re-meas. of this object see pg. 165 this book. Also measured two next stars. The mean of the four meas. is practically the same as the result obtained by above measurement.

| | h | m | s | | |
|---|---|---|---|---|---|
| Result as per above – | 21 | 18 | 21.0 | −50° | 50'.4 |
| " " " meas. pg. 165 – | 21 | 18 | 20.6 | −50 | 50.4 |
| | 21 | 18 | 20.8 | −50° | 50.4 |

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1909phae.proj.2302B



As 7497 No. 18 Sept 29, 1909

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fm. | 21 | 20 | 30.6 | − 50 | 34.2 | |
| a. | −50 | 11547 | 21 | 18 | 21.6 | −50 | 35.1 | +24.2 | = 21 | 18 | 45.6 35.4 | − 5.5 4 | = −50 | 40.6 5 |
| b. | −50 | 11554 | 21 | 20 | 8.1 | −50 | 56.5 | −7 8.9 | = 21 | 18 | 47.4 9.2 | + 16.9 58 | = −50 | 40.7 |
| c. | −51 | 11672 | 21 | 20 | 42.9 | −51 | 39.0 | | | 21 | 18 47.4 | | −50 | 40.6 |
| | | | | | | | | | | | | | | |
| | | | | | | | c − b = | + 34.8 | | | − 1.8 | + 1.8 | − 0.1 | + 0.1 |

$\frac{c_{52} - 51.6}{2}$

.310

+ 10.8

| | x | y | x | y |
|---|---|---|---|---|
| a | 37.4 | 169.2 | 42.4 | 165.4 |
| b | 70.0 | 126.7 | 75.0 | 125.8 |
| n | 45.0 | 158.3 | 50.0 | 154.5 |

| x | x | y | y |
|---|---|---|---|
| n-a + 7.6 | n-b − 25.0 | n-a − 10.9 | n-b + 31.6 |
| + 7.6 | − 25.0 | − 10.9 | + 31.7 |
| + 7.6 | − 25.0 | − 10.9 | + 31.65 |
| + 7.68 | − 25.25 | − 11.01 | + 31.97 |
| ÷ .317 | ÷ .317 | − 5.50 | + 15.98 |
| + 24.2 | − 79.7 | | |
| √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 19 Sept. 29, 1909.

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 21 | 18 | 25.0 | | −50 | 41.0 | |
| a. | −50 | 11540 | 20 | 14 | 29.3 | −50 | 42.1 | +13 | 0.9 | = 21 | 16 | 41.5 | 0.2 | −5.8 | = −50 | 47.3 | 4 |
| b. | −50 | 11554 | 20 | 20 | 8.1 | −50 | 56.5 | −20 | 8.4 | = 21 | 16 | 41.8 | 8.9 | + 9.9 | = −50 | 47.5 | 6 |
| c. | −51 | 11672 | 20 | 20 | 42.9 | −50 | 39.0 | | | | 21 | 16 | 41.0 | | −50 | 47.4 | |
| | | | | | x | | | | | | | | | | | | |
| | | | | | c − b = + 34.8 | | | | | | | | − 0.8 | + 0.8 | − 0.1 | + 0.2 | |
| | | | | | .310 | | | | | | | | | | | | |
| | | | | | + 10.8 | | | | | | | | | | | | |

$\frac{c_{00} - 50.6'}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 3.5 | 147.0 | 8.4 | 154.3 |
| b | 110.0 | 118.7 | 115.0 | 125.8 |
| n | 44.8 | 136.4 | 49.8 | 143.8 |

| | x | x | y | y |
|---|---|---|---|---|
| n − a | + 41.3 | n − b − 65.2 | n − a − 10.6 | n − b + 17.7 |
| | + 41.4 | − 65.2 | − 10.5 | + 18.0 |
| | + 41.35 | − 65.2 | − 10.55 | + 17.85 |
| | + 41.76 | − 65.85 | − 10.65 | + 18.03 |
| | ÷ .316 | ÷ .316 | − 5.32 | + 9.02 |
| | + 132.2 | − 208.4 | | |

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1909phae.proj.2302B



A 7497 No. 20, Sept. 29, 1909

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 1900 fno. | 21 41 25.9 | −51 1.5 | |
| a | −51 11729 | 21 37 33.2 | −51 11.2 | +13 | = | 21 39 43.3 + 3.0 | = −51 8.2 | |
| b | −51 11738 | 21 40 55.2 | −51 6.3 | −6 | = | 21 39 46.1 − 2.3 | = −51 7.6 | |
| c | −52 11934 | 21 37 37.1 | −52 10.1 | | | 21 39 45.4 | −51° 8.4 | |
| | | x | | | | | | |
| | | c − a = + 3.9 | | | | −1.6 +1.5 | −0.2 +0.2 | |
| | | .306 | | | | | | |
| | | + 1.2 | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 10.0 | 146.4 | 15.0 | 157.0 |
| b | 72.5 | 156.8 | 77.4 | 167.4 |
| n | 51.0 | 152.3 | 56.0 | 162.8 |

| | x | x | y | y |
|---|---|---|---|---|
| | n − a + 41.0 | n − b − 21.5 | n − a + 5.9 | n − b − 4.5 |
| | + 41.0 | − 21.4 | + 5.8 | − 4.6 |
| | + 41.0 | − 21.45 | + 5.85 | − 4.55 |
| | + 41.41 | − 21.68 | + 5.91 | − 4.69 |
| | ÷ .314 | ÷ .314 | + 2.96 | − 2.295 |
| | + 131.9 | − 69.0 | | |

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1909phae.proj.2302B



A 7497 No. 21 Sept. 29, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fm. | 21 | 48 | 30.6 | − 51 | 7.7 |
| a. | −50 | 11622 | 21 | 45 | 9.9 | − 50 | 55.8 | + 99.8 | = 21 | 45 | 49.7 | − 19.3 | = − 51 | 15.5 |
| b. | −51 | 11755 | 21 | 48 | 48.5 | − 51 | 39.6 | − 127.8 | = 21 | 46 | 50.7 | + 25.2 | = − 51 | 14.2 |
| c. | −51 | 11738 | 21 | 40 | 55.2 | − 51 | 6.3 | | | 21 | 46 | 50.5 | | −51° 14'.8 |
| | | | | | x | | | | | | | | | |
| | | | | | $c - \frac{b}{x}$ = − 483.3 | | | | | | + 1.1 | + 1.2 | | + 0.3 − 0.4 |

$\frac{\cos -51.1}{2}$

.314

− 150.8

| | x | y | x | y |
|---|---|---|---|---|
| a | 94.1 | 10.5.7 | 99.2 | 114.4 |
| b | 165.0 | 17.0 | 170.0 | 25.5 |
| n | 125.4 | 67.2 | 130.4 | 75.8 |

| x | x | y | y |
|---|---|---|---|
| n − a + 31.3 | n − b − 39.6 | m a − 38.5 | n − b + 50.2 |
| + 31.2 | − 39.6 | − 38.6 | + 50.3 |
| + 31.25 | − 39.6 | − 38.55 | + 50.25 |
| + 31.56 | − 40.00 | − 38.93 | + 50.75 |
| ÷ .313 | ÷ .313 | − 19.46 | + 25.38 |
| + 100.8 | − 127.8 | | |
| √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 22, Sept. 30, 1909

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fro. | 21 | 33 | 52.6 | − 51 | 7.1 |
| a. | − 51 | 11700 | 21 | 29 | 39.2 | − 51 | 19.0 | + 153.1 | = 21 | 32 | 18.8 | + 4.8 | = − 51 | 14.2 |
| b. | − 51 | 11714 | 21 | 36 | 51.4 | − 51 | 1.0 | − 287.0 | = 21 | 32 | 8.4 | − 13.4 | = − 51 | 13.8 |
| c. | − 52 | 11908 | 21 | 30 | 8.3 | − 52 | 1.3 | | | 21 | 32 | 8.4 | | − 51 | 13.8 |

c − a = + 29.1

.308

+ 9.0

Cor −52.0 / 2

+0.2 −0.3 +0.4 −0.3

| | x | y | x | y |
|---|---|---|---|---|
| a | 10.0 | 99.8 | 15.0 | 90.5 |
| b | 146.4 | 125.6 | 151.4 | 124.5 |
| η | 57.5 | 101.2 | 62.4 | 100.0 |

error in solution of step 13.

| x | x | y | y |
|---|---|---|---|
| η − a + 47.5 | η − b − 88.9 | η − a + 9.4 | η − b − 24.4 |
| + 47.4 | − 89.0 | + 9.5 | − 24.5 |
| + 47.45 | − 88.95 | + 9.45 | − 24.45 |
| + 47.92 | − 89.84 | + 9.54 | − 24.69 |
| ÷ .313 | ÷ .313 | + 4.77 | − 12.345 |
| + 153.1 | − 287.0 | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 92.0 | 10.0 | 108.5 |
| b | 100.4 | 110.4 | 95.5 | 117.7 |
| η | 62.4 | 103.6 | 57.5 | 110.9 |

| x | x | y | y |
|---|---|---|---|
| η − a + 47.4 | η − b − 38.0 | η − a + 9.6 | η − b − 6.8 |
| + 47.5 | − 38.0 | + 9.4 | − 6.8 |
| + 47.45 | − 38.0 | + 9.5 | − 6.8 |
| + 47.92 | − 38.38 | + 9.60 | − 6.87 |
| ÷ .313 | ÷ 313 | + 4.80 | − 3.44 |
| + 153.1 | − 122.6 | | |

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1909phae.proj.2302B



A 7497 No. 23 Sept. 30, 1909.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 jun. | 21 | 3 2 | 50.8 | − 51 | 8.2 |
| a: | − 51 | 11700 | 21 | 29 | 39.2 | − 51 | 19.0 | + 11.0 | = 21 | 31 | 10.2 | + 3.8 | = − 51 | 15.2 |
| b: | − 51 | 11714 | 21 | 38 | 51.4 | − 51 | 10.2 | − 3.9 | = 21 | 31 | 6.3 | − 13.3 | = − 51 | 14.8 |
| c: | − 52 | 11908 | 21 | 30 | 8.3 | − 52 | 1.3 | | | 21 | 31 | 8.8 | | − 52 | 14.8 |
| | | | | x | | | | | | | | | | |
| | | | c − a = | | + 29.1 | | | | | + 0.3 | − 0.3 | | | + 0.3 − 0.3 |
| | | | | | .308 | | | | | | | | | |
| | | | | | + 9.0 | | | | | | | | | |

$\frac{c_{00} - 52.0}{\Sigma}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 10.0 | 98.8 | 15.0 | 90.5 |
| b | 146.4 | 125.6 | 151.4 | 174.5 |
| η | 38.2 | 99.4 | 43.2 | 98.4 |

error in selection of star B.

| | x | x | y | y |
|---|---|---|---|---|
| | n a + 28.2 | n − b − 108.2 | n a + 7.6 | n − b − 26.2 |
| | + 28.2 | − 108.2 | + 7.6 | − 26.4 |
| | + 28.2 | − 108.2 | + 7.6 | − 26.3 |
| | + 28.48 | − 109.28 | + 7.68 | − 26.56 |
| | ÷ .313 | ÷ .313 | + 3.84 | − 13.28 |
| | + 91.0 | − 349.1 | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 94.0 | 10.0 | 100.5 |
| b | 100.4 | 110.4 | 95.5 | 117.7 |
| η | 43.1 | 101.6 | 38.2 | 109.0 |

| | x | x | y | y |
|---|---|---|---|---|
| | n a + 28.1 | n − b − 57.3 | n a + 7.6 | n − b − 8.8 |
| | + 28.2 | − 57.3 | + 7.5 | − 8.7 |
| | + 28.15 | − 57.3 | + 7.55 | − 8.75 |
| | + 28.43 | − 57.87 | + 7.63 | − 8.84 |
| | ÷ 313 | ÷ .313 | + 3.81 | − 4.42 |
| | + 90.8 | − 185.0 | | |

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1909phae.proj.2302B



A 7497 No. 25 Sept. 30, 1909

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 21 32 39.3 | − 51 10.1 |
| a. | − 51 | 11700 | 21 29 39.2 | − 51 | 19.0 | + 78.8 | = 21 30 57.3 + 1.8 | = − 51 17.2 |
| b. | − 51 | 11714 | 21 36 11.7 | − 51 | 10.2 | − 196.8 | = 21 30 59.6 − 6.3 | = − 51 16.5 |
| c. | − 52 | 11908 | 21 30 8.3 | − 52 | 1.3 | | 21 30 57.1 | − 51 16.8 |
| | | | x | | | | | |
| | | | c − a = + 29.8 | | | | + 0.2 − 0.2 | + 0.4 − 0.3 |
| | | | .308 | | | | | |
| | | | + 9.0 | | | | | |

$\frac{C_{00} - 52.0}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 94.0 | 10.0 | 101.5 |
| b | 100.4 | 110.4 | 95.5 | 117.7 |
| n | 39.4 | 97.6 | 38.5 | 105.0 |

| x | x | y | y |
|---|---|---|---|
| n − a + 24.4 | n − b − 61.0 | n − a + 3.6 | n − b − 12.8 |
| + 24.5 | − 61.0 | + 3.5 | − 12.7 |
| + 24.45 | − 61.0 | + 3.55 | − 12.75 |
| + 24.69 | − 61.61 | + 3.59 | − 12.88 |
| ÷ .313 | ÷ .313 | + 1.795 | − 6.44 |
| + 78.9 | − 196.8 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



# A 7497 No. 25, Sept 30, 1909

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 Jan. | 21 | 32 | 19.6 | − 51 | 10.3 |
| a = | −51 | 11700 | 21 | 29 | 39.2 | −51 | 19.0 | + 59.5 X = | 21 | 30 | 38.9 | + 1.7 = | −51 | 17.3 |
| b = | −51 | 11744 | 21 | 38 | 51.4 | −51 | 10.2 | X 4.5 − 216.7 = | 21 | 30 | 35.2 | − 6.4 = | −51 | 16.6 |
| c = | −52 | 11908 | 21 | 30 | 8.3 | −52 | 1.3 | | 21 | 30 | 32.8 | | −51 | 17.0 |
| | | | | | x | | | | | | | | | |
| | | | | | c − a = + 29.1 | | | | | | + 0.3 − 0.2 | | | + 0.3 − 0.4 |

$\frac{c_{00} - 52.0}{2}$

.308

+ 9.0

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 94.0 | 10.0 | 101.5 |
| b | 100.4 | 110.4 | 95.5 | 117.7 |
| m | 33.2 | 97.4 | 28.4 | 104.9 |

| x | x | y | y |
|---|---|---|---|
| m − a + 18.2 | m − b − 67.2 | m − a + 3.4 | m − b − 13.0 |
| + 18.4 | − 67.1 | + 3.4 | − 12.8 |
| + 18.3 | − 67.15 | + 3.4 | − 12.9 |
| + 18.48 | − 67.82 | + 3.43 | − 13.03 |
| ÷ .313 | ÷ .313 | + 1.72 | − 6.52 |
| + 59.1 | − 216.7 | | |

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1909phae.proj.2302B



A 7497 No. 26 Sept. 30, 1909.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 21 32 52.4 | -51 13.5 | |
| a | -51 | 11702 | 21 29 48.2 | -51 | 50.2 | +69.5 | = 21 31 9.0 + 1.5 | -51 20.7 | |
| b | -51 | 11727 | 21 37 4.2 | -51 | 10.2 | -295.9 | = 21 31 13 - 9.5 | -51 19.6 | |
| c | -52 | 11908 | 21 30 8.3 | -52 | 1.3 | | 21 31 10.2 9.9 | -51 20.2 | |
| | | | c-a = +8.1 | | | | -1.2 +1.1 | +0.5 -0.6 | |

$\frac{\text{Cva} - 52.0}{2}$

.308

+2.5

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 85.3 | 20.0 | 92.9 |
| b | 148.2 | 107.0 | 153.3 | 114.8 |
| n | 36.5 | 88.3 | 41.6 | 96.0 |

| | x | x | y | y |
|---|---|---|---|---|
| n-a | +21.5 | n-b -91.7 | n-a +3.0 | n-b -18.7 |
| | +21.6 | -91.7 | +3.1 | -18.8 |
| | +21.55 | -91.7 | +3.05 | -18.75 |
| | +21.76 | -92.62 | +3.08 | -18.94 |
| | ÷.313 | ÷.313 | +1.54 | -9.47 |
| | +69.5 | -295.9 | | |

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1909phae.proj.2302B



A 7497 No. 27 Sept. 30, 1909

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 1900 Jan. | 21 | 23 | 20.2 | −51 | 0,3 |
| a: | −51 | 11671 | 21 | 20 | 42.5 | −51 | 1.9 | +54.6 | = | 21 | 21 | 36.5 | −51 | 6.9 |
| b. | −51 | 11676 | 21 | 23 | 52.7 | −51 | 20.0 | −136.5 | = | 21 | 21 | 37.6 | −51 | 6.8 |
| c: | −52 | 11883 | 20 | 20 | 38.6 | −52 | 57.2 | | | 21 | 21 | 37.0 | −51 | 6.8 |
| | | | | | 40.3 | | | | | | | | | |
| | | | | | x | | | | | | | | | |
| | | | c − a = | | − 2.2 | | | | | | −0.5 | +0.6 | +0.1 | −0.1 |

$\frac{\cos -52.3}{2}$ .306

− 0.7

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 172.3 | 20.0 | 165.0 |
| b | 74.2 | 135.8 | 78.2 | 128.4 |
| η | 31.9 | 162.2 | 36.9 | 154.9 |

| | x | x | y | y |
|---|---|---|---|---|
| | n − a | n − b | n − a | n − b |
| | + 16.9 | − 42.3 | − 10.1 | + 26.4 |
| | + 16.9 | − 42.3 | − 10.1 | + 26.5 |
| | + 16.9 | − 42.3 | − 10.1 | + 26.45 |
| | + 17.07 | − 42.72 | − 10.20 | + 26.71 |
| | ÷ .313 | ÷ .313 | − 5.10 | + 13.36 |
| | + 54.6 | − 136.5 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 28 Sept. 30, 1909

| | | | | |
|---|---|---|---|---|
| | | | 1900 fm. 21 22 56.8 | − 51 8.3 |
| a = −51 11669 | 21 19 58.9 | −51 17.0 + 75.5 (4.7) | = 21 21 14.4 (3.6) + 2.2 | = −51 14.8 |
| b = −51 11681 | 21 24 31.7 | −51 9.6 − 200.7 (198.) | = 21 21 11.0 (3) − 5.2 (1) | = −51 14.8 (7) |
| c = −51 11888 (878) | 21 25 28.2 (19 40.8) | −51 55.2 (2 24) | 21 21 17.7 (3.3) | −51 14.8 |

x

c − a = −18.1

cos −51.8 / 2

.309

− 5.5

+0.3 −0.3     0.0 −0.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 144.4 | 25.0 | 150.5 |
| b | 105.6 | 158.9 | 110.6 | 165.2 |
| n | 43.4 | 148.6 | 48.4 | 154.9 |

| x | x | y | y |
|---|---|---|---|
| n−a + 23.4 | n−b − 62.2 | n−a + 4.2 | n−b − 10.3 |
| + 23.4 | − 62.2 | + 4.4 | − 10.3 |
| + 23.4 | − 62.2 | + 4.3 | − 10.3 |
| + 23.63 | − 62.82 | + 4.34 | − 10.40 |
| ÷ .313 | ÷ .313 | + 2.17 | − 5.2 |
| + 75.5 | − 200.7 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 29 Sept. 30, 1909.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fm. | 21 | 39 | 54.2 | -51 26.6 |
| a. | -51 | 11726 | 21 | 36 | 54.7 | -51 | 22.1 | +7 | 6.7 1.5 = 21 | 38 | 6.4 12.2 | -11.3 2 = -51 33.3 |
| b. | -51 | 11737 | 21 | 40 39 | 36.1 | -51 | 56.6 | -14 | 1.5 1.8 = 21 | 38 | 15.8 46 | +23.4 2 = -51 33.4 |
| c. | -52 | 11929 | 21 | 37 | 4.6 | -52 | 8.1 | | | 21 | 38 13.0 17.7 | -51 33.4 |
| | | | | x | | | | | | | | |
| | | | c-a = | | + 9.9 | | | | | - 1.6 | + 1.6 | - 0.1 0.0 |
| | | | | | .307 | | | | | | | |
| | | | | | + 3.0 | | | | | | | |

$\frac{\text{Obs} - 52.1}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 152.2 | 20.0 | 162.7 |
| b | 82.7 | 83.5 | 87.6 | 93.8 |
| n | 38.8 | 129.9 | 43.8 | 140.2 |

| | x | x | y | y |
|---|---|---|---|---|
| n-a | + 23.8 | m-b - 43.9 | m-a - 22.3 | m-b + 46.4 |
| | + 23.8 | - 43.8 | - 22.5 | + 46.4 |
| | + 23.8 | - 43.85 | - 22.4 | + 46.4 |
| | + 24.04 | - 44.29 | - 22.62 | + 46.86 |
| | ÷ .310 | ÷ .310 | - 11.31 | + 23.43 |
| | + 77.5 | - 142.9 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 30 October 1, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fro. | 21 | 37 47.2 | -51 | 29.7 |
| a = | -51 | 11717 | 21 | 34 21.7 | -51 | 33.5 | +10 3.4 | = 21 | 36 44.1 | -3.0 = -51 36.5 |
| b = | -51 | 11730 | 21 | 37 52.2 | -51 | 38.4 | -10 6.3 | = 21 | 36 45.9 | +1.9 = -51 36.5 |
| c = | -52 | 11921 | 21 | 34 40.6 | -52 | 40.3 | | | 21 36 5.4 | -51° 36.5 |
| | | | x | | | | | | | |
| | | | c - a = | + 18.9 | | | | | -0.5 +0.5 | 0.0 0.0 |
| c₀₀ - 52.7 / 2 | | | | .303 | | | | | | |
| | | | | + 5.7 | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 154.3 | 25.0 | 165.0 |
| b | 84.9 | 144.6 | 90.0 | 155.2 |
| η | 52.0 | 148.4 | 57.0 | 159.0 |

| | x | x | y | y |
|---|---|---|---|---|
| η-a | +32.0 | η-b - 32.9 | η-a - 5.9 | η-b + 3.8 |
| | +32.0 | - 33.0 | - 6.0 | + 3.8 |
| | +32.0 | -32.95 | -5.95 | + 3.8 |
| | +32.32 | -33.28 | -6.01 | + 3.84 |
| | ÷.310 | ÷.310 | -3.00 | + 1.92 |
| | -104.½ | -107.4 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 31. October 1, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 prec. | 21 | 34 | 37.0 | −51 21.0 |
| a. | −51 | 11704 | 21 | 31 | 2.2 | −51 | 25.7 | + 11 × 0.8 | = 21 32 54.1 | − 2.6 = −51 28.3 |
| b. | −51 | 11721 | 21 | 36 | 8.7 | −51 | 32.8 | − 193 × 1.7 | = 21 32 54.1 | + 5.6 = −51 27.3 |
| c. | −52 | 11910 | 21 | 31 | 10.8 | −52 | 8.0 | | 21 32 55.0 | −51 27.8 |

c − a = + 8.6

.307

+ 2.6

$\frac{c - a - 52.1}{2}$

− 2.0 + 2.0 + 0.5 − 0.5

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 163.8 | 25.0 | 172.2 |
| b | 114.0 | 149.7 | 119.1 | 158.0 |
| η | 54.4 | 158.8 | 59.5 | 167.1 |

| x | x | y | y |
|---|---|---|---|
| η − a + 34.4 | η − b − 59.6 | η − a − 5.0 | η − b + 11.1 |
| + 34.5 | − 59.6 | − 5.1 | + 11.1 |
| + 34.445 | − 59.6 | − 5.05 | + 11.1 |
| + 34.79 | − 60.20 | − 5.10 | + 11.21 |
| ÷ .311 | ÷ .311 | − 2.55 | + 5.60 |
| + 111.9 | − 193.6 | | |
| √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 32 October 1, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 prs. | 21 | 32 | 32.3 | -51 24.1 |
| a = | -52 | 11908 | 21 | 30 | 8.3 | -52 | 1.3 | +4 | 21 | 30 50.5 + 30.4 = -51 30.9 |
| b = | -51 | 11704 | 21 | 31 | 2.2 | -51 | 25.7 | -12 | 21 | 30 49.5 - 5.0 = -51 30.8 |
| c = | -52 | 11912 | 21 | 31 | 40.6 | -52 | 27.7 | | 21 | 30 49.8 -51 30.8 |

x

c - b = + 38.4

.305

+ 11.7

c00 - 52.4 / 2

+0.3 -0.2 +0.2 -0.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 23.1 | 83.8 | 78.2 | 94.3 |
| b | 40.0 | 154.6 | 45.0 | 164.9 |
| η | 36.1 | 144.4 | 41.1 | 154.8 |

| x | x | y | y |
|---|---|---|---|
| η - a + 13.0 | η - b - 3.9 | η - a + 60.6 | η - b - 10.2 |
| +12.9 | -3.9 | +60.5 | -10.1 |
| +12.95 | -3.9 | +60.55 | -10.15 |
| +13.08 | -3.94 | +61.15 | +10.25 |
| ÷ .310 | ÷ .310 | +30.58 | +5.18/2 |
| +42.2 | -12.7 | | |
| ✓ | ✓ | | |

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1909phae.proj.2302B



A 7497 No. 33. October 1, 1909.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 prec. | 21 | 32 | 23.9 | − | 51 | 31.1 |
| a = | −52 | 11908 | 21 | 30 | 8.3 | − 52 | 1.3 | + 27.2 | − 21 | 30 | 35.5 | + 23.6 | = − 51 | 37.8 |
| b = | −51 | 11704 | 21 | 31 | 2.2 | − 51 | 25.7 | − 21.2 | = 21 | 30 | 41.0 | − 12.8 | = − 51 | 37.4 |
| c = | −52 | 11912 | 21 | 31 | 40.6 | − 52 | 27.7 | | 21 | 30 | 41.5 | | − 51 | 37.8 |
| | | | | | | | | | +0.3 | −0.2 | | | +0.1 | −0.1 |

c − b = + 38.4

Cos −52.4 / 2

.305

+ 11.7

| | x | y | x | y |
|---|---|---|---|---|
| a | 23.1 | 83.8 | 28.2 | 94.3 |
| b | 40.0 | 154.6 | 45.0 | 164.9 |
| η | 33.5 | 130.6 | 38.5 | 141.0 |

| | x | x | y | y |
|---|---|---|---|---|
| η − a | + 8.4 | η − b − 6.5 | η − a + 46.8 | η − b − 24.0 |
| | + 8.3 | − 6.5 | + 46.7 | − 23.9 |
| | + 8.35 | − 6.5 | + 46.75 | − 23.95 |
| | + 8.43 | − 6.56 | + 47.22 | − 24.19 |
| | ÷ .310 | ÷ .310 | + 23.61 | − 12.095 |
| | + 8.2 | − 21.2 | | |

✓ ✓

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1909phae.proj.2302B



A 7497 No. 34 October 1, 1909.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 pro. | 21 | 23 | 5.7 | -51 | 20.7 | |
| a | -51 | 11665 | 21 | 17 | 29.9 | -51 | 38.1 | + 233.7 | = 21 | 21 | 28.4 | + 11.8 | = -51 | 26.8 |
| b | -51 | 11676 | 21 | 18 | 26.9 | -51 | 18.2 | - 151.7 | = 21 | 21 | 24.4 | - 7.8 | = -51 | 27.4 |
| c | -52 | 11889 | 21 | 23 | 29.3 | -52 | 37.4 | | | 21 | 21 | 21.9 | -51 | 27.2 |
| | | | | | | | | | | | | | | |
| | | | | | | c-b = | -23.4 | | | | -0.6 | +0.6 | -0.3 | +0.3 |
| | | | | | | | .304 | | | | | | | |
| | | | | | | | -7.1 | | | | | | | |

Cos -52.6 / 2

| | x | y | x | y |
|---|---|---|---|---|
| a | 1.4 | 134.7 | 6.3 | 142.4 |
| b | 120.0 | 172.0 | 125.0 | 179.8 |
| η | 73.3 | 157.0 | 78.3 | 164.9 |

| x | x | y | y |
|---|---|---|---|
| n-a + 71.9 | n-b - 46.7 | n-a + 22.3 | n-b - 15.0 |
| + 72.0 | - 46.7 | + 22.5 | - 14.9 |
| + 71.95 | - 46.7 | + 22.4 | - 14.95 |
| + 72.67 | - 47.17 | + 22.62 | - 15.10 |
| ÷ .311 | ÷ .311 | + 11.31 | - 7.55 |
| + 233.7 | - 151.7 | | |
| J | J | | |

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1909phae.proj.2302B



A 7497 No. 35 October 1, 1909.

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 1900 fwo. | 21 | 13 | 4.8 | −51 | 28.7 |
| a. | −51 | 11642 | 21 | 10 | 14.8 | −51 | 42.1 | +65.X | = | −21 | 11 | 19.X | +7.X | = | −51 | 35.X |
| b. | −51 | 11655 | 21 | 13 | 42.0 | −51 | 18.1 | −143.X | = | −21 | 11 | XX.X | ÷ 17X | = | −51 | 35.X |
| c. | −52 | 11871 | 21 | 17 | 28.7 | −52 | 16.9 | | | 21 | 11 | 19.X | | | −51° | 35.0 |
| | | | | | x | | | | | | | | | | | |
| | | | c−b = | | +226.7 | | | | | | | −0.3 | +0.4 | | 0.0 | 0.0 |
| Cor = −52.3 / 2 | | | | | .306 | | | | | | | | | | | |
| | | | | | +69.4 | | | | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 5.8 | 74.2 | 10.8 | 76.8 |
| b | 70.0 | 122.3 | 75.0 | 125.0 |
| η | 25.9 | 88.4 | 30.8 | 91.0 |

| | x | x | y | y |
|---|---|---|---|---|
| | n−a | n−b | n−a | n−b |
| | +20.1 | −44.1 | +14.2 | −33.9 |
| | +20.0 | −44.2 | +14.2 | −34.0 |
| | +20.05 | −44.15 | +14.2 | −33.95 |
| | +20.25 | −44.59 | +14.34 | −34.29 |
| | ÷.311 | ÷.311 | +7.17 | −17.14 |
| | +65.1 | −143.4 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



# a 7497 No. 36. October 1, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fno. | 21 | 19 | 51.5 | -51 | 33.8 |
| a. | -51 | 11662 | 21 | 16 | 58.9 | -51 | 41.0 | +69.5 | = 21 | 18 | 8.4 | +0.9 | = -51 40.1 |
| b. | -51 | 11667 | 21 | 18 | 39.9 | -51 | 40.2 | -34.2 | = 21 | 18 | 5.7 | +0.0 | = -51 40.2 |
| c. | -52 | 11878 | 21 | 19 | 40.8 | -52 | 24.4 | | 21 | 18 | 7.8 | | -51° 40.2 |
| | | | | | | | | | | | | +1.4 | -1.3 -0.1 0.0 |

$\frac{\cos \delta - 52.4}{2}$

x

c − b = + 60.9

.305

+ 18.6

| | x | y | x | y |
|---|---|---|---|---|
| a | 22.9 | 97.6 | 27.8 | 113.3 |
| b | 55.0 | 99.4 | 60.0 | 115.0 |
| m | 44.4 | 99.4 | 49.4 | 115.0 |
| | x | x | y | y |
| | m-a +21.5 | m-b −10.6 | m-a +1.8 | m-b +0.0 |
| | +21.6 | −10.6 | +1.7 | +0.0 |
| | +21.55 | −10.6 | +1.75 | +0.0 |
| | +21.79 | −10.71 | +1.77 | +0.0 |
| | ÷.310 | ÷.310 | +0.88 | |
| | +70.2 | −34.5 | | |

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1909phae.proj.2302B



A 7497 No. 37 October 1, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 pos. | 21 | 21 | 55.8 | −51 | 33.3 |
| a | −51 | 11667 | 21 | 18 | 39.9 | −51 | 40.2 | +93.2 | 21 | 20 | 15.2 | +0.5 | −51 39.7 |
| b | −51 | 11672 | 21 | 20 | 42.9 | −51 | 39.0 | −31.3 | 21 | 20 | 11.6 | −0.9 | −51 39.9 |
| c | −52 | 11884 | 21 | 20 | 40.8 | −52 | 13.2 | | 21 | 20 | 12.4 | | −51° 39.8 |
| | | | | | | | | | +0.2 | −0.1 | | −0.1 | +0.1 |

c − b = − 2.1

$\frac{c_{00} - 52.2}{2}$ .306

− 0.6

| | x | y | x | y |
|---|---|---|---|---|
| a | 46.8 | 108.4 | 51.8 | 96.8 |
| b | 85.0 | 111.2 | 90.0 | 99.8 |
| η | 75.4 | 109.4 | 80.4 | 97.9 |

| | x | x | y | y |
|---|---|---|---|---|
| | η − a | η − b | η − a | η − b |
| | + 28.6 | − 9.6 | + 1.0 | − 1.8 |
| | + 28.6 | − 9.6 | + 1.1 | − 1.9 |
| | + 28.6 | − 9.6 | + 1.05 | − 1.85 |
| | + 28.89 | − 9.70 | + 1.06 | − 1.87 |
| | ÷ .310 | ÷ .310 | + 0.53 | − 0.94 |
| | + 93.2 | − 31.3 | | |

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1909phae.proj.2302B



A 7497 No. 38 October 1, 1909.

| | | | | | | 1900 fno. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| a | −51 11687 | 21 23 59.2 | −51 | 41.4 | +36.4 | = 21 24 45.8 | −10.1 | = −51 | 51.5 | |
| b | −52 11896 | 21 26 20.8 | −52 | 22.6 | −107.4 | = 21 24 35.4 | +31.3 | = −51 | 51.6 | |
| c | −51 11685 | 21 25 29.2 | −51 | 3.9 | | 21 24 34.5 | | −51 | 51.4 | |
| | | x | | | | | | | | |
| | | c − b = −536 | | | | +0.4 | −0.3 | −0.1 | 0.0 | |

$\frac{c_{00} - 51.0}{2}$

.315

−16.9

| | x | y | x | y |
|---|---|---|---|---|
| a | 26.2 | 102.4 | 31.1 | 111.7 |
| b | 70.0 | 20.2 | 75.0 | 29.5 |
| n | 37.3 | 82.1 | 42.2 | 91.4 |

| x | x | y | y |
|---|---|---|---|
| n − a + 11.1 | n − b − 32.7 | n − a − 20.3 | n − b + 61.9 |
| + 11.1 | − 32.8 | − 20.3 | + 61.9 |
| + 11.1 | − 32.75 | − 20.3 | + 61.9 |
| + 11.21 | − 33.08 | − 20.50 | + 62.52 |
| ÷ .308 | ÷ .308 | − 10.25 | + 31.26 |
| + 36.4 | − 107.4 | | |

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1909phae.proj.2302B



A 7497 No. 38. October 1, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fun. | 21 | 36 | 49.1 | −51 | 49.5 | | |
| a = | −52 | 11910 | 21 | 31 | 10.8 | −52 | 8.0 | + 238.2 | = 21 | 35 | 55.8 / 56.9 | + 11.2 | = −51 / 44.8 |
| b = | −51 | 11732 | 21 | 38 | 19.2 | −51 | 46.6 | − 193.5 | = 21 | 35 | 1.6 / 7.6 / 55.7 | − 9.2 | = −51 / 56.8 |
| c = | −51 | 11704 | 21 | 31 | 2.2 | −51 | 25.7 | | 21 | 35 | 7.4 | | −51 56.3 |

x

c − a = − 8.6

.312

− 2.7

− 0.5 + 0.5

+ 0.6 − 0.6

cos − 51.4 / 2

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 20.0 | 20.0 | 31.5 |
| b | 146.6 | 60.3 | 151.7 | 72.2 |
| n | 87.6 | 42.0 | 92.7 | 53.8 |

| x | x | y | y |
|---|---|---|---|
| n−a + 72.6 | n−b − 59.0 | n−a + 22.0 | n−b − 18.3 |
| + 72.7 | − 59.0 | + 22.3 | − 18.4 |
| + 72.65 | − 59.0 | + 22.15 | − 18.35 |
| + 73.38 | − 59.59 | + 22.37 | − 18.43 |
| ÷ .308 | ÷ .308 | + 11.18 | − 9.22 |
| + 238.2 | − 193.5 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



# A 7497 No. 40. October 1, 1909.

| | | | | | | 1900 fro. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 21 | 28 | 47.6 | -51 45.4 |
| a = -51 | 11686 | 21 | 25 | 28.2 | -51 | 51.2 | +9 6.7 = 21 | 27 4.9 | -0.8 = | -51 52.0 |
| b = -51 | 11697 | 21 | 28 | 31.2 | -51 | 53.2 | -8 7.3 = 21 | 27 3.6 | +1.3 = | -51 51.9 |
| c = -52 | 11894 | 21 | 25 | 40.3 | -51 | 32.1 | | 21 | 27 4.4 | -51 52.0 |

x

c − a = +12.1

·311

+3.8

+0.5 −0.5 0.0 −0.1

$\frac{c_0 - 51.5}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 139.1 | 20.0 | 152.5 |
| b | 71.7 | 134.9 | 76.7 | 148.4 |
| n | 44.8 | 137.5 | 49.8 | 150.9 |

| x | x | y | y |
|---|---|---|---|
| n − a +29.8 | m − b −26.9 | n − a −1.6 | m − b +2.6 |
| +29.8 | −26.9 | −1.6 | +2.5 |
| +29.8 | −26.9 | −1.6 | +2.55 |
| +30.10 | −27.17 | −1.62 | +2.57 |
| ÷.308 | ÷.308 | −0.81 | +1.28 |
| +97.7 | −88.2 | | |
| √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 41 October 1, 1909.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 21 28 56.9 | −51 52.1 |
| a. | −52 11897 | 21 26 56.5 | −52 1.2 | +18.2 | = | 21 27 14.5 | +2.5 | = −51 58.7 |
| b. | −51 11692 | 21 27 22.2 | −51 55.5 | −9.9 | = | 21 27 12.8 | −3.2 | = −51 58.7 |
| c. | −52 11898 | 21 28 40.3 | −52 43.0 | | | 21 27 13.5 | | −51° 58.7 |
| | | x | | | | | | |
| | | c − b = + 18.1 | | | | + 1.1 | − 1.0 | 0.0 0.0 |

cos −52.7 / 2

.303

+ 5.5

| | x | y | x | y |
|---|---|---|---|---|
| a | 41.5 | 133.3 | 36.4 | 147.7 |
| b | 50.0 | 144.5 | 45.0 | 159.0 |
| η | 47.0 | 138.1 | 42.0 | 152.8 |
| | x | x | y | y |
| | η − a + 5.5 | η − b − 3.0 | η − a + 4.8 | η − b − 6.4 |
| | +5.6 | −3.0 | +4.9 | −6.2 |
| | +5.65 | −3.0 | +4.95 | −6.3 |
| | +5.61 | −3.03 | +5.00 | −6.36 |
| | ÷ .308 | ÷ .308 | +2.50 | −3.18 |
| | +18.2 | −9.9 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



a 7497 No. 42 October 1, 1909

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 1900 prs. | 21 | 30 | 58.5 | | −51 | 41.1 | | |
| a = | −52 | 11897 | 21 | 26 | 56.5 | −52 | 1.2 | +14 | 0.4 0.8 | = | 21 | 29 | 18.3 6.9 | +13. 0 | = | −51 | 48.2 | a |
| b = | −51 | 11708 | 21 | 31 | 55.2 | −51 | 32.0 | −16 | 0.2 0.8 | = | 21 | 29 | 13.4 5.0 | −15.5 | = | −51 | 47.5 | b |
| c = | −52 | 11898 | 21 | 27 | 40.3 | −52 | 43.0 | | | | 21 | 29 | 15.8 16.0 | | | −51° | 47.8 | c |
| | | | | | x | | | | | | | | | | | | | |
| | | | c − a = | | + 43.8 | | | | | | | | +0.9 − 0.8 1.0 | | | | +0.4 − 0.3 | |
| c₀₀ − 52.7 / 2 | | | | | .303 | | | | | | | | | | | | | |
| | | | | | + 13.3 | | | | | | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 111.7 | 25.0 | 122.1 |
| b | 112.8 | 168.7 | 118.0 | 179.2 |
| η | 63.4 | 137.7 | 68.4 | 145.8 |

| | x | x | y | y |
|---|---|---|---|---|
| | n − a | n − b | n − a | n − b |
| | + 43.4 | − 49.4 | + 26.0 | − 31.0 |
| | + 43.4 | − 49.6 | + 26.9 | − 31.2 |
| | + 43.4 | − 49.5 | + 25.95 | − 31.1 |
| | + 43.83 | − 50.00 | + 26.21 | − 31.41 |
| | ÷ .309 | ÷ .309 | + 13.10 | − 15.70 |
| | + 141.8 | − 161.8 | | |
| | ✓ | ✓ | | |

See Page 166 this book for 12" meas. of this neb.
The results obtained by the meas. of the original set of plates together with this neb. plate prove much considerable.

Results as obtained by above meas. 21′ 29″ 15″.8 −57° 47′.9
" " " " meas. pg. 166 21 29 15.4 −51 47.8

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1909phae.proj.2302B



# A 7497 No. 43 October 1, 1909.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 1900 fwd. | 21 32 | 46.5 | −51 50.8 |
| a = −52 11908 | 21 30 8.3 | −52 1.3 | +55.9 | = | 21 31 | 3.4 | +3.9 | = −51 57.4 |
| b = −51 11718 | 21 34 21.7 | −51 40.5 | −198.7 | = | 21 31 | 4.0 | −17.7 | = −51 57.8 |
| c = −52 11921 | 21 34 40.6 | −52 40.3 | | | 21 31 | 3.7 | | −51° 57.6 |
| | | | | | | | | |
| | | | c − b = + 18.9 | | | −0.3 | +0.3 | −0.2 +0.2 |
| | | | .303 | | | | | |
| c₀ − 52.7 / 2 | | | + 5.4 | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 16.6 | 127.4 | 21.6 | 135.5 |
| b | 95.0 | 169.6 | 100.0 | 177.8 |
| n | 33.6 | 135.2 | 38.6 | 143.4 |

| x | x | y | y |
|---|---|---|---|
| n − a + 17.0 | n − b − 61.4 | n − a + 7.8 | n − b − 34.4 |
| + 17.1 | − 61.4 | + 7.9 | − 34.4 |
| + 17.05 | − 61.45 | + 7.85 | − 34.45 |
| + 17.27 | − 61.81 | + 7.883 | − 34.879 |
| ÷ 309 | ÷ 309 | + 3.94 | − 17.445 |
| + 55.7 | − 200.2 | | |

✓ ✓

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1909phae.proj.2302B



A 7497 No. 44 October 2, 1909.

1900 fno. 21 35 47.6 − 51 41.1

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| a = −51 11709 | 21 32 38.4 | −51 58.5 | + 8.7 | = 21 34 5.1 | + 10.5 | = −51 48.0 | | a = |
| b = −51 11721 | 21 36 8.7 | −51 32.8 | − 12.8 | = 21 34 5.9 | − 15.2 | = −51 48.0 | | b = |
| c = −52 11927 | 21 36 20.6 | −52 18.2 | | 21 34 5.8 | | −51° 48' 0" | | c = |
| | N | | | | | 47.9 | | |
| | c − b = + 11.9 | | | − 1.1 | + 1.1 | + 0.1 | − 0.1 | |
| c₀₀ − 52.3 / 2 | .306 | | | | | | | |
| | + 3.6 | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.5 | 109.3 | 25.5 | 116.7 |
| b | 85.0 | 160.4 | 90.0 | 167.7 |
| n | 47.3 | 130.2 | 52.2 | 137.6 |

| | x | x | y | y |
|---|---|---|---|---|
| n − a | + 26.8 | n − b − 37.7 | n − a + 20.9 | n − b − 30.2 |
| | + 26.7 | − 37.8 | + 20.9 | − 30.1 |
| | + 26.75 | − 37.75 | + 20.9 | − 30.15 |
| | + 27.02 | − 38.13 | + 21.11 | − 30.45 |
| | ÷ .310 | ÷ .310 | + 10.56 | − 15.23 |
| | + 87.2 | − 123.0 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



see page 164 for 2nd meas. of this neb. Selected new set of stars by the results are closer than those of this comp. The diff. in R.A being much less than in this Comp. But the diff in Dec. is only 0.5 smaller. Have recorded meas. on pg. 164.

A 7497 No. 45 October 2, 1909.

There are three objects which look nebulous. - Have taken the middle obj. for meas.

1905 for 21 36 1.9 − 51 44.0

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a | −52 | 11903 | 21 | 29 | 2.8 | −52 | 8.7 | +315.0 | = 21 | 34 | 19.2 | + 16.8 = −51 52.6 |
| b | −51 | 11730 | 21 | 37 | 52.2 | −51 | 38.4 | −218.9 | = 21 | 34 | 15.5 | − 11.8 = −51 50.1 |
| c | −51 | 11699 | 21 | 29 | 19.7 | −51 | 21.2 | | 21 | 34 | 17.8 | −51° 51.9 |
| | | | | | | | | | | | 18.7 | 50.8 |

c − a = + 16.9

.313

+ 5.3

Cor − 51.3 / 2

+ 1.8 − 1.9
+ 05 − 32

+ 1.2 − 1.3
+ 18 − 87

| | x | y | x | y |
|---|---|---|---|---|
| a | 10.0 | 20.7 | 15.0 | 15.0 |
| b | 174.2 | 76.4 | 179.2 | 70.7 |
| η | 107.5 | 53.0 | 112.4 | 47.3 |
| | x | x | y | y |
| | η − a + 97.5 | η − b − 66.7 | η − a + 32.3 | η − b − 23.4 |
| | + 97.4 | − 66.8 | + 32.3 | − 23.4 |
| | + 97.45 | − 66.75 | + 32.3 | − 23.4 |
| | + 98.42 | − 67.43 | + 32.62 | − 23.63 |
| | ÷ .308 | ÷ .308 | + 16.31 | − 11.82 |
| | + 319.5 | − 218.9 | | |

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1909phae.proj.2302B



see page 168 for means of this reb.
~~Butterfield of other selected clusters~~

A 7497 No. 46 October 2, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| a. | −52 | 11908 | 21 30 8.3 | −52 | 1.3 | +305.0 | = 21 35 | 10.3 | +14.6 | = −51 46.5 |
| b. | −51 | 11730 | 21 37 52.2 | −51 | 38.4 | −166.4 | = 21 35 | 7.5 | −6.5 | = −51 44.9 |
| c. | −51 | 11700 | 21 29 39.2 | −51 | 19.0 | | 21 35 | 8.9 | | −51 45.8 |

c − a = −29.1

Cos −51.3 / 2

.313

−9.1

+1.4 −1.4 +0.9 −0.9

| | x | y | x | y |
|---|---|---|---|---|
| a | 25.0 | 19.0 | 30.0 | 27.5 |
| b | 169.2 | 61.3 | 174.2 | 70.0 |
| η | 118.3 | 48.3 | 123.3 | 57.0 |

| x | x | y | y |
|---|---|---|---|
| η − a +93.3 | η − b −50.9 | η − a +29.3 | η − b −13.0 |
| +93.3 | −50.9 | +29.5 | −13.0 |
| +93.3 | −50.9 | +29.4 | −13.0 |
| +94.23 | −51.41 | +29.69 | −13.13 |
| ÷ .309 | ÷ .309 | +14.845 | −6.56 |
| +305.0 | −166.4 | | |

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1909phae.proj.2302B



A 7497 No. 47 October 2, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 jno. | 21 | 40 | 0.9 | − 51 46.5 |
| a. | − 51 | 11731 | 21 38 18.9 | − 51 | 58.4 | +0.6 | = 21 38 19.5 | +4.9 | | = − 51 | 53.6 |
| b. | − 51 | 11732 | 21 38 19.2 | − 51 | 46.6 | 0.0 | = 21 38 19.2 | −6.5 | | = − 51 | 53.1 |
| c. | − 52 | 11933 | 21 37 36.6 | − 52 | 49.1 | | 21 38 19.4 | | | | − 51° 53.3 |
| | | | x | | | | | | | | |
| | | | c − a = − 42.3 | | | | +0.1 −0.2 | | | | +0.2 −0.2 |
| | | | .302 | | | | | | | | |
| | | | − 12.8 | | | | | | | | |

$\frac{\text{Coo} - 52.8}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 45.0 | 125.6 | 50.0 | 134.1 |
| b | 45.2 | 148.8 | 50.2 | 157.2 |
| η | 45.2 | 135.6 | 50.2 | 144.1 |

| | x | x | y | y |
|---|---|---|---|---|
| η a | +0.2 η−b | 0.0 | η−a + 10.0 η−b | − 13.2 |
| | +0.2 | 0.0 | + 10.0 | − 13.1 |
| | +0.2 | 0.0 | + 10.0 | − 13.15 |
| | +0.2 | 0.0 | + 10.10 | − 13.28 |
| | ÷.308 | ÷.308 | + 5.05 | − 6.64 |
| | + 0.6 | 0.0 | | |
| | J | | | |

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1909phae.proj.2302B



Note- No. 48 is rejected.

A 7497 No. 48 (9) October 2, 1909

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fus. | 21 40 4.1 | −51 59.5 | |
| a = | −52 11934 | 21 37 37.1 | −52 10.1 | +46.1 (5.6) | = | 21 38 28.2 (2.7) | +3.8 | = −52 6.3 | a |
| b = | −51 11737 | 21 40 36.1 | −51 56.6 | −135.1 (3.87) | = | 21 38 21.9 (2.4) | −9.8 (7) | = −52 6.1 (3) | b |
| c = | −51 11734 | 21 36 51.4 | −51 1.0 | | | 21 38 12.1 (6) | | −52° 6.1 (3) | c |
| | | x | | | | | +0.1 −0.2 | 0.0 0.0 | |

c − a = −45.7

Cos a −51.0 / 2

.315

−14.4

| | x | y | x | y |
|---|---|---|---|---|
| a | 30.0 | 34.4 | 35.0 | 40.0 |
| b | 85.3 | 61.4 | 90.2 | 67.0 |
| η | 44.1 | 43.9 | 49.0 | 47.6 |

| | x | x | $y_1$ | $y_2$ |
|---|---|---|---|---|
| η − a | +14.1 | −41.2 | +8.5 | −18.5 |
| η − b | −14.0 | −41.2 | −7.6 | −19.4 |
| | +14.05 | −41.2 | +7.55 | −19.45 |
| | +14.19 | −41.61 | +7.63 | −19.64 |
| | ÷.308 | ÷.308 | +3.82 | −9.82 |
| | +46.1 | −135.1 | | |
| | √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 50. October 2, 1909.

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | 1900 prs. | 21 | 40 | 20.0 | - 52 | 0.5 |
| a | = -51 | 11738 | 21 | 37 | 52.2 | - 51 | 38.4 | +44.4 | = | 21 | 38 | 39.6 | - 28.2 | = | - 52 | 7.3 | | | |
| b | - 52 | 11938 | 21 | 38 | 50.6 | - 52 | 14.9 | -12.2 | = | 21 | 38 | 38.4 | + 7.3 | = | - 52 | 7.5 | | | |
| c | = - 52 | 11933 | 21 | 37 | 36.6 | - 52 | 49.1 | | | 21 | 38 | 38.8 | | | - 52 | 7.4 | | | |
| | | | | | x | | | | | | | | | | | | | | |
| | | | | c - a = | - 15.6 | | | | | | | | +0.3 | -0.4 | | -0.1 | +0.1 | | |

$\frac{c+a-52.8}{2}$

.302

- 4.7

| | x | y | x | y |
|---|---|---|---|---|
| a | 28.0 | 149.4 | 30.0 | 152.8 |
| b | 43.2 | 76.8 | 48.2 | 85.2 |
| n | 39.4 | 91.4 | 44.5 | 100.0 |
| | x | x | y | y |
| | n-a +14.4 | n-b - 3.8 | n-a - 58.0 | n-b - 14.6 |
| | +14.5 | - 3.7 | - 57.8 | - 14.8 |
| | +14.45 | - 3.75 | - 57.9 | - 14.7 |
| | +14.59 | - 3.79 | - 58.48 | - 14.85 |
| | ÷ .308 | ÷ .308 | - 29.24 | - 7.42 |
| | + 47.4 | - 12.3 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 51 October 2, 1909.

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fno. | 21 | 38 | 59.5 | -52 | 3.4 | | | |
| a. | -52 | 11915 | 21 | 33 | 21.6 | -52 | 14.7 | +23.8 | 21 | 37 | 17.4 | +4.4 | -52 | 10.3 | | a |
| b. | -52 | 11934 | 21 | 37 | 37.1 | -52 | 10.1 | -19.5 | 21 | 37 | 17.5 | +0.0 | -52 | 10.1 | | b. |
| c. | -51 | 11710 | 21 | 33 | 3.2 | -51 | 26.2 | | 21 | 37 | 17.3 | | -52° | 10.2 | | c. |

c - a = -18.4

.312

-5.7

-0.3 +0.3 +0.1 -0.1

$\frac{\text{Cos} -51.4}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 73.4 | 20.0 | 85.0 |
| b | 92.5 | 82.2 | 97.5 | 93.8 |
| η | 86.6 | 82.2 | 91.5 | 93.8 |

| x | x | y | y |
|---|---|---|---|
| η-a +71.6 | η-b -5.9 | η-a +8.8 | η-b +0.0 |
| +71.5 | -6.0 | +8.8 | +0.0 |
| +71.55 | -5.95 | +8.8 | +0.0 |
| +72.77 | -6.01 | +8.89 | +0.0 |
| ÷.306 | ÷.306 | +4.44 | +0.0 |
| +237.8 | -19.7 | | |
| √ | √ | | |

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1909phae.proj.2302B



A 7H97 No. 52 October 2, 1909.

| | | | | | | 1900 fm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| a. | −52 11915 | 21 33 21.6 | −52 | 14.7 | +22.8 | 21 37 4.4 | +3.8 | = −52 | 10.9 |
| b. | −52 11934 | 21 37 37.1 | −52 | 10.1 | −33.9 | 21 37 4.4 | −0.6 | = −52 | 10.7 |
| c. | −51 11710 | 21 33 3.2 | −51 | 26.2 | | 21 37 4.2 | | −52° | 10.8 |
| | | | | | | | −1.1 | +1.1 | +0.1 | −0.1 |

c−a = −18.4

.312

−5.7

$\frac{c-a-51.4}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 73.4 | 20.0 | 85.0 |
| b | 92.5 | 82.2 | 97.5 | 93.8 |
| m | 83.5 | 80.9 | 87.5 | 92.6 |

| x | x | y | y |
|---|---|---|---|
| m−a +67.5 | m−b −10.0 | m−a +7.5 | m−b −1.3 |
| +67.5 | −10.0 | +7.6 | −1.2 |
| +67.5 | −10.0 | +7.55 | −1.25 |
| +68.18 | −10.10 | +7.63 | −1.26 |
| ÷ .306 | ÷ .306 | +3.82 | −0.63 |
| +222.8 | −33.0 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



For pr. meas. of this net see pg. 169 this Bk.
Two new stars were also meas. Date results obtained
are practically the same as below —
Results obtained by means below 21 35 40.8 −50° 7.°0
" " " " by 169 — 21 35 40.4 −50. 7.2
Comp. dif. of res. in R.A. —
remains the same in
new meas.

A 7497 No. 53 October 3, 1909

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 prec. | 21 | 37 | 19.8 | −50 | 0.3 | |
| a = | −52 | 11908. | 21 30 8.3 | −52 | 1.3 | +335.1 | = 21 | 35 | 48.4 | −5.5 | = −52 | 6.8 | a |
| b = | −52 | 11934 | 21 37 37.1 | −52 | 10.1 | −118.8 | = 21 | 35 | 38.5 | +2.8 | = −52 | 7.3 | b |
| c = | −52 | 11933 | 21 37 36.6 | −52 | 49.1 | | | 21 | 35 | 39.8 | −50 | 7.0 | c |
| | | | | | | | | | | 39.6 | | | |

c − b = − 0.5

302

− 0.2

$\frac{c_{00} - 52.8}{2}$

+0.2 −0.3 −0.4 +0.3
+0.4 −0.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 7.1 | 108.2 | 12.0 | 118.6 |
| b | 145.0 | 89.9 | 150.0 | 107.5 |
| n | 108.9 | 95.4 | 113.9 | 107.9 |

| | x | x | y | y |
|---|---|---|---|---|
| n-a | +101.8 | n-b −36.1 | n-a −10.8 | n-b +5.5 |
| | +101.9 | −36.1 | −10.9 | +5.4 |
| | +101.85 | −36.1 | −10.85 | +5.45 |
| | +102.86 | −36.46 | −10.96 | +5.50 |
| | ÷.307 | ÷.307 | −5.48 | +2.75 |
| | +335.1 | −118.8 | | |

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1909phae.proj.2302B



A 7/9497 No. 54 October 4, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 21 | 36 | 20.2 | − 51 59.0 |
| a. | −52 11908 | 21 30 8.3 | −52 1.3 | + 272.X | 0.0 | = | 21 34 38.3 | − 4.1 | = | −52 5.4 |
| b. | −52 11934 | 21 37 37.1 | −52 10.1 | − 181.1 | 179.3 | = | 21 34 38.0 | + 4.0 | = | −52 6.1 |
| c. | −52 11933 | 21 37 36.6 | −52 49.1 | | | | 21 34 38.5 | | | −52° 5.8 |
| | | x | | | | | | | | |
| | | c − b = − 0.5 | | | | | + 0.3 − 0.2 | | | − 0.4 + 0.3 |

$\frac{\text{Cor} - 52.8}{2}$ .302

− 0.2

| | x | y | x | y |
|---|---|---|---|---|
| | | 59 | | |
| a | 7.1 | 108.7 | 12.0 | 118.6 |
| b | 145.0 | 89.9 | 150.0 | 103.5 |
| η | 90.0 | 97.8 | 94.9 | 100.4 |
| | x | x | y | y |
| | | | 8.9 | 7.9 |
| η − a | + 82.9 | η − b − 55.0 | η − a + 1.7 − 8.2 | η − b + 18.9 |
| | + 82.9 | − 55.1 | − 8.8 | + 7.9 |
| | + 82.9 | − 55.05 | − 8.15 | + 7.9 |
| | + 83.73 | − 55.60 | − 8.23 | + 7.98 |
| | ÷ .307 | ÷ .307 | − 4.12 | + 3.99 |
| | + 272.7 | − 181.1 | | |
| | √ | √ | | |

For 10 meas. of this object see pg. 170 this Bk.

Results do not vary any by new meas. Large def of res. in R.A. practically the same in each measurement.

Results as obtained by above meas. 21 34 38".5 −52° 5'.8

" " " 5 meas pg. 170 21 34 38.2 −52 5.9

21 34 38.4 −52° 5.8

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1909phae.proj.2302B



A 7497 No. 55 October 4, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fro. | 21 34 | 6.5 | -52 | 8.6 |
| a | -52 | 11908 | 21 30 8.3 | -52 | 1.3 | +138.9 | 21 32 | 23.2 | -52 | 13.8 |
| b | -52 | 11918 | 21 34 32.1 | -52 | 25.9 | -130.2 | 21 32 | 24.3 | -52 | 14.1 |
| c | -51 | 11718 | 21 34 22.7 | -51 | 40.5 | | 21 32 | 24.3 | -52 | 13.8 |

$\frac{c_{00} - 51.7}{2}$

x

c − b = − 9.4

· 310

− 2.9

+ 1.1 − 1.1
+ 16 − 06

− 0.3 + 0.3

| | x | y | x | y |
|---|---|---|---|---|
| a | 28.6 | 58.6 | 33.6 | 66.1 |
| b | 110.0 | 10.7 | 115.0 | 18.0 |
| 7 | 70.5 | 34.2 | 75.6 | 41.6 |

| x | x | y | y |
|---|---|---|---|
| n-a + 41.9 | n-b − 39.5 | n-a − 24.4 | n-b + 23.5 |
| + 42.0 | − 39.4 | − 24.5 | + 23.6 |
| + 41.95 | − 39.45 | − 24.45 | + 23.55 |
| + 42.37 | − 39.84 | − 24.69 | + 23.79 |
| ÷ .306 | ÷ .306 | − 12.345 | + 11.895 |
| + 138.5 | − 130.2 | | |
| √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 56 October 4, 1909.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fno. | 21 | 33 | 19.2 | − 52 | 1.1 | |
| a. | −52 | 11908 | 21 | 30 | 8.3 | − 52 | 1.3 | + 88.7 | = 21 | 31 | 37.6 | − 6.7 | = − 52 | 8.0 |
| b. | −52 | 11915 | 21 | 33 | 21.6 | − 52 | 14.7 | − 106.1 | = 21 | 31 | 35.5 | + 7.0 | = − 52 | 7.4 |
| c. | −51 | 17780 | 21 | 29 | 39.2 | − 51 | 19.0 | | 21 | 31 | 36.2 | | − 52° | 7.8 |
| | | | | | | | | | − 0.3 | | + 0.2 | | + 0.2 | − 0.1 |

c − a = − 29.1

$\frac{c+a}{2} = -51.3$

.313

− 9.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 30.0 | 32.5 | 35.0 | 39.9 |
| b | 89.2 | 4.9 | 94.2 | 12.5 |
| n | 56.9 | 19.0 | 62.0 | 26.4 |

| x | x | y | y |
|---|---|---|---|
| n−a +26.9 | n−b −32.3 | n−a −13.5 | n−b +14.1 |
| +27.0 | −32.2 | −13.5 | +13.9 |
| +26.95 | −32.25 | −13.5 | +14.0 |
| +27.22 | −32.57 | −13.64 | +14.14 |
| ÷ .307 | ÷ .307 | − 6.82 | +7.07 |
| + 88.7 | − 106.1 | | |
| √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 57 October 4, 1909.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | 1900 prec. | 21 32 19.9 | -52 8.2 | |
| a = -51 11692 | 21 27 22.2 | -51 55.5 | +194.1 | = | 21 30 34.8 | -19.8 = | -52 15.4 |
| b = -52 11914 | 21 32 48.1 | -52 27.8 | -130.0 | = | 21 30 37.1 | +13.8 = | -52 14.5 |
| c = -52 11898 | 21 27 40.3 | -52 43.0 | | | 21 30 37.4 | | -52 14.9 |
| | | | | | -2.5 | +2.5 | +0.3 -0.3 |
| | c-a = +18.1 | | | | | | |
| | .303 | | | | | | |
| | +5.5 | | | | | | |

$\frac{c_{00} - 52.7}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 10.0 | 108.0 | 15.0 | 116.4 |
| b | 108.2 | 42.2 | 113.2 | 50.8 |
| η | 68.8 | 68.6 | 73.8 | 77.0 |
| | x | x | y | y |
| | η-a +58.8 | η-b -39.4 | η-a -39.4 | η-b +26.4 |
| | +58.8 | -39.4 | -39.4 | +26.2 |
| | +58.8 | -39.4 | -39.4 | +26.3 |
| | +59.39 | -39.79 | -39.79 | +26.56 |
| | ÷.306 | ÷.306 | -19.895 | +13.28 |
| | +194.1 | -130.0 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 58 October 4, 1909.

1900 fm. 21 25 48.5 − 52 1.2

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| a = −52 11884 | 21 20 40.8 | −52 13.2 | +204.6 | = | 21 24 5.4 | +10.0 | = −52 | 7.3 |
| b = −51 11697 | 21 28 31.2 | −51 53.2 | −266.8 | = | 21 24 4.4 | −15.2 | = −52 | 8.2 |
| c = −52 11906 | 21 29 20.8 | −52 36.1 | | | 21 24 4.4 | | −52 | 7.8 |
| | | | | | 21 24 5.0 | | | |
| | x | | | | | | | |
| Cos −52.6 / 2 | c − b = +49.6 | | | | −0.4 | +0.3 | −0.5 | +0.6 |
| | .304 | | | | | | | |
| | +15.1 | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 6.3 | 61.3 | 11.2 | 70.1 |
| b | 150.0 | 111.3 | 155.0 | 120.0 |
| η | 68.7 | 81.1 | 73.6 | 90.0 |
| | x | x | y | y |
| n−a | +62.4 | n−b −81.3 | n−a +19.8 | n−b −30.2 |
| | +62.4 | −81.4 | +19.9 | −30.0 |
| | +62.4 | −81.35 | +19.85 | −30.1 |
| | +63.02 | −82.16 | +20.05 | −30.40 |
| | ÷.308 | ÷.308 | +10.02 | −15.20 |
| | +204.6 | −266.8 | | |
| | +205.3 | −267.6 | | |

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1909phae.proj.2302B



A 7497 No. 59 October 4, 1909

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fm. | 21 | 25 | 37.8 | −52 | 0.7 | | |
| a | −52 | 11884 | 21 | 20 | 40.8 | −52 | 13.2 | +193.8 | = 21 | 23 | 54.8 | +10.4 | = −52 | 7.8 |
| b | −51 | 11697 | 21 | 28 | 31.2 | −51 | 53.2 | −276.6 | = 21 | 23 | 53.6 | −14.8 | = −52 | 8.0 |
| c | −52 | 11906 | 21 | 29 | 20.8 | −52 | 36.1 | | 21 | 23 | 54.0 | | −52° | 7.3 |

c − b = + 49.6

.304

+ 15.1

−0.6 +0.6 −0.5 +0.5

| | x | y | x | y |
|---|---|---|---|---|
| a | 6.3 | 61.3 | 11.2 | 70.1 |
| b | 150.0 | 113.5 | 155.0 | 120.0 |
| n | 65.4 | 82.0 | 70.3 | 90.8 |

| | x | x | y | y |
|---|---|---|---|---|
| n − a | +59.1 | n − b −84.6 | n − a +20.7 | n − b −29.3 |
| | +59.1 | −84.7 | +20.7 | −29.2 |
| | +59.1 | −84.65 | +20.7 | −29.25 |
| | +59.69 | −85.50 | +20.91 | −29.54 |
| | ÷.308 | ÷.308 | +10.46 | −14.77 |
| | +193.8 | −276.6 | | |

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1909phae.proj.2302B



A 7497 No. 60. October 4, 1909

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fm. | 21 | 24 | 34.2 | −52 | 6.1 | | |
| a = | −52 | 11878 | 21 | 19 | 40.8 | −52 | 24.4 | + 189.8 | = 21 | 22 | 48.7 | + 12.5 | = −52 | 12.9 | 12.0 |
| b = | −51 | 11692 | 21 | 27 | 22.2 | −51 | 55.5 | − 273.2 | = 21 | 22 | 51.8 | − 17.8 | = −52 | 13.2 | |
| c = | −52 | 11898 | 21 | 27 | 40.3 | −52 | 43.0 | | | 21 | 22 | 49.9 | −52° | 12.6 | 13.2 |
| | | | | | x | | | | | | | | | | |
| | | | c − b = | | + 18.1 | | | | | | − 1.5 | + 1.6 | | − 0.6 | + 0.6 |
| | | | | | .303 | | | | | | | | | | |
| | | | | | + 5.5 | | | | | | | | | | |

$\frac{C_{00} - 52.7}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 9.3 | 52.7 | 14.3 | 61.2 |
| b | 150.0 | 113.0 | 155.0 | 121.5 |
| η | 67.0 | 77.5 | 72.0 | 86.0 |

| | x | x | y | y |
|---|---|---|---|---|
| η − a | + 57.7 | η − b − 83.0 | η − a + 24.8 | η − b − 35.5 |
| | + 57.7 | − 83.0 | + 24.8 | − 35.5 |
| | + 57.7 | − 83.0 | + 24.8 | − 35.5 |
| | + 58.28 | − 83.83 | + 25.05 | − 35.86 |
| | ÷ .307 | ÷ .307 | + 12.52 | − 17.93 |
| | + 189.8 | − 273.2 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



# A 7497 No. 61 October 4, 1909

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fus. | 21 16 35.8 | -51 57.9 | | |
| a = | -51 11658 | 21 14 48.7 | -51 40.8 | +2.5 | = | 21 14 51.2 | -23.6 | = | -52 4.2 | | a |
| b = | -52 11863 | 21 14 49.2 | -52 19.0 | +1.3 | = | 21 14 50.5 | +14.8 | = | -52 4.3 | | b |
| c = | -51 11669 | 21 17 23.4 | -51 23.2 | | | 21 14 50.8 | | | -52° 4.'2 | | c |
| | | x | | | | | | | | | |
| Cor | -51.4 | c-b = +154.2 | | | | +0.4 -0.3 | | | 0.0 +0.1 | | |
| | I | .312 | | | | | | | | | |
| | | +48.1 | | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| | 19.7 | 138.4 | | |
| a | ~~20.0~~ | ~~54.0~~ | 24.6 | 140.7 |
| b | 20.0 | 54.0 | 25.0 | 64.5 |
| η | 20.4 | 83.6 | 25.4 | 94.0 |

| | x | | x | | y | | y | |
|---|---|---|---|---|---|---|---|---|
| n-a | +0.7 | n-b | +0.4 | n-a | -46.8 | n-b | +29.6 | |
| | +0.8 | | +0.4 | | -46.7 | | +29.5 | |
| | +0.75 | | +0.4 | | -46.75 | | +29.55 | |
| | +0.76 | | +0.4 | | -47.22 | | +29.85 | |
| | ÷.308 | | ÷.308 | | -23.61 | | +14.92 | |
| | +2.5 | | +1.3 | | | | | |

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1909phae.proj.2302B



A 7497 No. 62 October 4, 1909

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fno. | 21 | 50 | 46.7 | − 51 | 41.5 |
| a = | −51 | 11755 | 21 | 48 | 58.5 | −51 | 39.6 | +8.5 | = 21 | 49 | 6.9 8.9 | = −51 | 48.6 5 |
| b = | −52 | 11958 | 21 | 49 | 17.1 | −52 | 3.7 | −9.8 | = 21 | 49 | 7.3 +15.1 | = −51 | 48.4 6 |
| c = | −51 | 11744 | 21 | 43 | 19.7 | −51 | 9.9 | | 21 | 49 | 7.2 | −51° | 48.5 6 |
| | | | | x | | | | | | | | | |
| | | | c − b = | −357.4 | | | | | −0.3 | +0.2 | | −0.1 | 0.0 |
| c₀₀ = | −51.7 | | | .314 | | | | | | | | | |
| | 2 | | | 112.2 | | | | | | | | | |
| | | | | −55.4 | | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 114.4 | 78.3 | 119.4 | 101.6 |
| b | 120.0 | 30.0 | 125.0 | 53.5 |
| η | 117.0 | 60.4 | 122.0 | 83.8 |

| | x | x | y | y |
|---|---|---|---|---|
| η − a | +2.6 | η − b − 3.0 | η − a − 17.9 | η − b +30.4 |
| | +2.6 | −3.0 | −17.8 | +30.3 |
| | +2.6 | −3.0 | −17.85 | +30.35 |
| | +2.63 | −3.03 | −18.03 | +30.65 |
| | ÷.309 | ÷.309 | −9.02 | +19.32 |
| | +8.5 | −9.8 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 63 October 5, 1909.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 21 39 48.9 | -52 12.5 | |
| a = | -52 11917 | 21 33 51.6 | -52 45.9 | +256.4 | = | 21 38 8.5 + 26.6 | = -52 19.3 | a |
| b = | -52 11938 | 21 38 50.6 | -52 14.9 | -42.4 | = | 21 38 8.6 - 4.7 | = -52 19.6 | b |
| c = | -53 10151 | 21 39 24.7 | -53 30.1 | | | 21 38 7.1 | -52° 19'.4 | c |
| | | x | | | | | | |
| | | c - b = +34.1 | | | | -1.5 +1.5 | -0.1 +0.2 | |
| $\frac{c_{02} - 53.5}{2}$ | | .297 | | | | | | |
| | | +10.1 | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 10.0 8.1 | 105.9 | 15.0 | 112.4 |
| b | 100.0 | 164.4 | 105.0 | 175.0 |
| η | 86.3 | 155.0 | 92.2 | 165.7 |

| | x | x | y | y |
|---|---|---|---|---|
| η-a | +77.3 | η-b -12.7 | η-a +53.2 | η-b -9.4 |
| | +77.2 | -12.8 | +53.3 | -9.3 |
| | +77.25 | -12.75 | +53.25 | -9.35 |
| | +78.02 | -12.88 | +53.78 | -9.44 |
| | ÷.304 | ÷.304 | +26.89 | -4.72 |
| | +256.6 | -42.4 | | |
| | √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 64 October 5, 1909.

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 1900 jno. | 21 | 39 | 22.4 | −52 | 15.6 |
| a | −52 | 11917 | 21 | 33 | 51.6 | −52 | 45.9 | +22 | = | 21 | 37 | +23.7 | = −52 | 22.2 |
| b | −52 | 11938 | 21 | 38 | 50.6 | −52 | 14.9 | −69.5 | = | 21 | 37 | 41.8 − 7.6 | = −52 | 22.5 |
| c | −53 | 10151 | 21 | 39 | 24.7 | −53 | 30.1 | | | 21 | 37 | 40.4 | | −52° 22'.4 |
| | | | | | x | | | | | | | | | |
| | | | c − b = | | + 34.1 | | | | | | | −1.5 | +1.4 | −0.2 +0.1 |

$\frac{C_{00} - 53.5}{2}$

.297

+ 10.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 10.0 8.4 | 105.0 | 15.0 | 112.4 |
| b | 100.0 | 164.4 | 105.0 | 175.0 |
| n | 78.4 9.2 | 150.0 49.1 | 84.0 | 159.7 |

| | x | x | y | y |
|---|---|---|---|---|
| n − a | +69.2 | n − b − 20.8 | n − a + 47.3 | n − b − 15.3 |
| | +69.0 | −21.0 | +47.3 | −15.3 |
| | +69.1 | −20.9 | +47.3 | −15.3 |
| | +69.79 | −21.11 | +47.77 | −15.45 |
| | ÷ .304 | ÷ .304 | +23.88 | −7.72 |
| | +229.6 | −69.5 | | |

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1909phae.proj.2302B



A 7497 No. 65 October 5, 1909.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 prs. | 21 38 30.8 | -52 9.3 |
| a | -52 11927 | 21 36 20.6 | -52 | 18.2 | +28.2 | = 21 36 48.8 | +2.1 | = -52 16.1 |
| b | -52 11935 | 21 40 36.4 | -52 | 56.6 | -52.3 | = 21 36 48.3 | -4.9 | = -52 16.1 |
| c | -51 11721 | 21 36 8.7 | -51 | 32.8 | | 21 36 48.6 | | -52° 16'.1 |

c-a = -11.9

.311

-3.7

-0.1 +0.2 0.0 0.0

Coe $\frac{-51.5}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 30.0 | 60.8 | 35.0 | 72.4 |
| b | 54.4 | 74.8 | 59.4 | 86.3 |
| η | 38.6 | 65.0 | 43.5 | 76.6 |

| | x | x | y | y |
|---|---|---|---|---|
| η-a | +8.6 | η-b -15.8 | η-a +4.2 | η-b -9.8 |
| | +8.5 | -15.9 | +4.2 | -9.7 |
| | +8.55 | -15.85 | +4.2 | -9.75 |
| | +8.63 | -16.01 | +4.24 | -9.85 |
| | ÷.306 | ÷.306 | +2.12 | -4.92 |
| | +28.2 | -52.3 | | |
| | √ | √ | | |

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1909phae.proj.2302B



a 7497 No. 66. October 5, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fm. | 21 | 38 | 40.4 | − 52 | 13.0 |
| a. | −52 | 11925 | 21 35 49.1 | −52 | 41.1 | +69.7 | = | 21 | 36 | 58.1 | +21.3 | = −52 | 19.8 |
| b. | −52 | 11934 | 21 37 37.1 | −52 | 10.1 | −39.3 | = | 21 | 36 | 58.2 | − 9.7 | = −52 | 19.8 |
| c. | −51 | 11720 | 21 35 28.7 | −51 | 28.6 | | | 21 | 36 | 58.2 | | −52° | 19.8 |

x

c − a = − 20.4

Cos −51.5 / Σ .311

− 6.3

− 0.1 0.0 0.0 0.0

| | x | y | x | y |
|---|---|---|---|---|
| a | 35.0 | 14.7 | 40.0 | 19.0 |
| b | 67.9 | 76.7 | 72.9 | 81.0 |
| n | 56.0 | 57.3 | 61.1 | 61.7 |

| x | x | y | y |
|---|---|---|---|
| n − a + 21.0 | n − b − 11.9 | n − a + 42.6 | n − b − 19.4 |
| + 21.1 | − 11.8 | + 42.7 | − 19.3 |
| + 21.05 | − 11.85 | + 42.65 | − 19.35 |
| + 21.26 | − 11.97 | + 43.08 | − 19.54 |
| ÷ .305 | ÷ .305 | + 21.54 | − 9.77 |
| + 69.7 | − 39.3 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 67 October 5, 1909.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 Jno. | 21 | 37 | 55.1 | − 52 | 16.2 | |
| a. | − 52 | 11917 | 21 | 33 | 51.6 | − 52 | 45.9 | + 139.0 | = 21 | 36 | 10.6 | + 23.0 | = − 52 | 22.9 |
| b. | − 52 | 11934 | 21 | 37 | 37.1 | − 52 | 10.1 | − 82.6 | = 21 | 36 | 14.5 | − 13.0 | = − 52 | 23.1 |
| c. | − 52 | 11933 | 21 | 37 | 36.6 | − 52 | 49.1 | | 21 | 36 | 12.8 | | − 52° | 23.0 |
| | | | | x | | | | | | | | | | |
| | | | c − b = − 0.5 | | | | | | − 2.0 | | + 1.9 | | − 0.1 | + 0.1 |

$\frac{\text{Cor} - 52.8}{2}$

.302

− 0.2

| | x | y | x | y |
|---|---|---|---|---|
| a | 22.4 | 52.6 | 27.4 | 63.3 |
| b | 90.0 | 124.3 | 95.0 | 135.0 |
| n | 64.8 | 98.4 | 69.8 | 109.2 |
| | x | x | y | y |
| n − a | + 42.4 | n − b − 25.2 | n − a + 45.8 | n − b − 25.9 |
| | + 42.4 | − 25.2 | + 45.9 | − 25.8 |
| | + 42.4 | − 25.2 | + 45.85 | − 25.85 |
| | + 42.82 | − 25.45 | + 46.31 | − 26.11 |
| | ÷ .305 | ÷ .305 | + 23.16 | − 13.06 |
| | + 140.4 | − 83.4 | | |

√ √

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1909phae.proj.2302B



A 7497 No. 68 October 5, 1909.

| | | | | | | 1900 fro. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| a. | −52 11912 | 21 31 40.6 | −52 | 27.7 | +117.7 | 21 | 33 | 36.8 | −52° | 20.'4 |
| b. | −52 11923 | 21 35 12.6 | −52 | 15.0 | −97.9 | 21 | 33 | 34.8 | −52° | 20.'1 |
| c. | −51 11705 | 21 31 26.2 | −51 | 3.2 | | 21 | 33 | 36.2 | −52° | 20.'2 |

×

c − a = − 14.4

Cos $\frac{-51.0}{2}$

.315

− 4.5

+0.4 −0.4 +0.2 −0.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 10.0 | 10.6 | 15.0 | 17.2 |
| b | 75.2 | 35.7 | 80.1 | 42.3 |
| n | 45.5 | 25.3 | 50.5 | 32.0 |

| x | x | y | y |
|---|---|---|---|
| n−a + 35.5 | n−b − 29.7 | n−a + 14.7 | n−b − 10.4 |
| + 35.5 | − 29.6 | + 14.8 | − 10.3 |
| + 35.5 | − 29.65 | + 14.75 | − 10.35 |
| + 35.86 | − 29.95 | + 14.90 | − 10.45 |
| ÷ .306 | ÷ .306 | + 7.45 | − 5.22 |
| + 117.2 | − 97.9 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



# A7497 No. 69. October 5, 1909

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fws. | 21 34 | 31.7 | −52 | 12.0 |
| a. | −52 | 11912 | 21 31 | 40.6 | −52 | 27.7 | +69.7 = | 21 32 | 50.5 | +9.2 = | −52 | 18.8 |
| b. | −52 | 11915 | 21 33 | 21.6 | −52 | 14.7 | −33.0 = | 21 32 | 48.8 | −4.1 = | −52 | 18.8 |
| c. | −52 | 11705 | 21 31 | 26.2 | −51 | 3.2 | | 21 32 | 49.2 | | −52° | 18.8 |
| | | | | x | | | | | | |
| | | | c − a = | −14.4 | | | | +0.4 | −0.3 | | 0.0 | 0.0 |
| | | | | .315 | | | | | | | | |
| | | | | −4.5 | | | | | | | | |

Cos δ − 51.0 / I

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 17.2 | 20.0 | 11.0 |
| b | 46.1 | 43.3 | 51.1 | 37.0 |
| η | 36.2 | 35.1 | 41.0 | 28.8 |

| | x | x | y | y |
|---|---|---|---|---|
| | n−a + 21.2 | n−b − 9.9 | n−a + 17.9 | n−b − 8.2 |
| | +21.0 | −10.1 | +17.8 | −8.2 |
| | +21.1 | −10.0 | +17.85 | −8.2 |
| | +21.31 | −10.10 | +18.03 | −8.28 |
| | ÷.306 | ÷.306 | +9.02 | −4.14 |
| | +69.7 | −33.0 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 74 97 No. 70. October 5, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fm. | 21 | 34 | 28.9 | −52 12.8 |
| a. | −52 | 11912 | 21 | 31 | 40.6 | −52 | 27.7 | +66.8 | = 21 | 32 | 47.4 +8.2 = −52 19.6 |
| b. | −52 | 11915 | 21 | 33 | 21.6 | −52 | 14.7 | −35.8 | = 21 | 32 | 45.8 −5.8 = −52 19.6 |
| c. | −51 | 11705 | 21 | 31 | 26.2 | −51 | 3.2 | | | 21 | 32 46.6 −52 19.6 |
| | | | | | | | | | | | +0.3 −0.2 0.0 0.0 |

x

c − a = −14.4

Cor −51.0 / 2

.315

−4.5

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 17.2 | 20.0 | 11.0 |
| b | 46.1 | 43.3 | 51.1 | 37.0 |
| n | 35.2 | 33.4 | 40.3 | 27.2 |

| x | x | y | y |
|---|---|---|---|
| n − a +20.2 | n − b −10.9 | n − a +16.2 | n − b −9.9 |
| +20.3 | −10.8 | +16.2 | −9.8 |
| +20.25 | −10.85 | +16.2 | −9.85 |
| +20.45 | −10.96 | +16.36 | −9.95 |
| ÷ .306 | ÷ .306 | +8.18 | −4.98 |
| +66.8 | −35.8 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7477 No. 71 October 5, 1909

| | | | | | | 1900 pos. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| a. | −52 11912 | 21 31 40.6 | −52 | 27.7 | +13.6 | = 21 31 54.2 | +8.0 | = −52 | 19.7 | a |
| b. | −51 11709 | 21 32 38.4 | −51 | 58.5 | −43.5 | = 21 31 54.9 | −21.4 | = −52 | 19.9 | b |
| c. | −51 11705 | 21 31 26.2 | −51 | 3.2 | | 21 31 54.6 | | −52 | 19.8 | c |
| | | | | | | −0.4 | +0.3 | −0.1 | +0.1 | |

Cor −51.0 / 2

c − a = −14.4 × .315 = −4.5

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 11.0 | 25.0 | 16.6 |
| b | 37.5 | 69.8 | 42.4 | 75.4 |
| n | 24.2 | 27.0 | 29.1 | 33.6 |

| x | x | y | y |
|---|---|---|---|
| n−a +4.2 m−b | −13.3 m−a | +16.0 n−b | −42.8 |
| +4.1 | −13.3 | +16.0 | −42.8 |
| +4.15 | −13.3 | +16.0 | −42.8 |
| +4.19 | −13.43 | +16.16 | −43.23 |
| ÷.306 | ÷.306 | +8.08 | −21.62 |
| +13.7 | −43.9 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



# a 7497 No. 72 October 5, 1909.

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 1900 Jan. | 21 | 33 | 12.6 | −52 | 15.5 |
| a. | −52 | 11910 | 21 | 31 | 10.8 | −52 | 8.0 | +19.0 | = | 21 | 31 | 29.8 | −14.2 | = −52 | 22.8 |
| b. | −53 | 11912 | 21 | 31 | 40.6 | −52 | 27.7 | −11.4 | = | 21 | 31 | 29.2 | +5.6 | = −52 | 22.8 |
| c. | −51 | 11705 | 21 | 31 | 26.2 | −51 | 3.2 | | | 21 | 31 | 29.4 | | −52 | 22.2 |
| | | | | | x | | | | | | | | | | |
| | | | | | c−b = −14.4 | | | | | +0.2 | −0.1 | | | 0.0 | −0.1 |
| $\frac{c_{03}-51.0}{2}$ | | | | | .315 | | | | | | | | | | |
| | | | | | −4.5 | | | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 10.8<br>20.0 | 50.5<br>XX.0 | 15.8 | 56.3 |
| b | 20.0 | 11.0 | 35.0 | 16.6 |
| n | 16.6 | 32.3 | 21.5 | 27.9 |
| | x | x | y | y |
| | n−a +5.8 | n−b −3.4 | n−a −28.2 | n−b +11.3 |
| | +5.7 | −3.5 | −28.4 | +11.3 |
| | +5.75 | −3.45 | −28.3 | +11.3 |
| | +5.81 | −3.48 | −28.58 | +11.41 |
| | ÷.306 | ÷.306 | −14.29 | +5.70 |
| | +19.0 | −11.4 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 73 October 7, 1909

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 1900 prec. | 21 32 58.2 | − 52 14.1 | |
| a = − 52 11897 | 21 26 56.5 | − 52 1.2 | + 259.5 | | = | 21 31 13.0 | − 20.2 | = − 52 21.4 | a. |
| b = − 52 11914 | 21 32 48.1 | − 52 27.8 | − 9.6 | | = | 21 31 16.8 | + 7.5 | = − 52 20.3 | b. |
| c = − 52 11898 | 21 27 40.3 | − 52 43.0 | | | | 21 31 15.7 | | − 52 20.8 | c. |
| | x | | | | | | | |
| | c − a = + 43.8 | | | | | − 2.2 + 2.3 | | + 0.6 − 0.5 | |
| | .303 | | | | | | | | |
| | + 13.3 | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 10.0 | 92.5 | 15.0 | 102.6 |
| b | 116.2 | 36.9 | 121.2 | 46.8 |
| n | 88.5 | 51.9 | 93.5 | 61.7 |

| x | x | y | y |
|---|---|---|---|
| n − a + 78.5 | n − b − 27.7 | n − a − 40.6 | n − b + 15.0 |
| + 78.5 | − 27.7 | − 40.3 | + 14.9 |
| + 78.5 | − 27.7 | − 40.5 | + 14.95 |
| + 79.28 | − 27.98 | − 40.90 | + 15.10 |
| ÷ 306 | ÷ 306 | − 20.45 | + 7.55 |
| + 259.1 | − 91.5 | | |

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1909phae.proj.2302B



A 7497 No. 74 October 7, 1909

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 1900 fno. | 21 31 36.2 | −52 15.5 | |
| a. | −52 11902 | 21 28 46.3 | −52 18.6 | +6 | 7.4 | = 21 29 53.4 | −3.7 = −52 | 22.3 |
| b. | −52 11912 | 21 31 40.6 | −52 27.7 | −10 | 8.2 | = 21 29 51.4 | +5.6 = −52 | 22.1 |
| c. | −51 11705 | 21 31 26.2 | −51 3.2 | | | 21 29 52.8 | | −52° 22.2 |
| | | x | | | | | | |
| | | c−b = −14.4 | | | | +0.7 −0.6 | +0.1 | 0.0 |
| | | .315 | | | | | | |
| | | −4.5 | | | | | | |

c = −51.0 / 2

| | x | y | x | y |
|---|---|---|---|---|
| a | 16.5 | 26.0 | 21.4 | 34.4 |
| b | 70.0 | 7.6 | 75.0 | 16.0 |
| η | 37.0 | 18.6 | 43.0 | 27.0 |
| | x | x | y | y |
| | η−a + 20.5 | m−b − 33.0 | m−a − 7.4 | m−b + 11.0 |
| | + 20.6 | − 33.0 | − 7.4 | + 11.0 |
| | + 20.55 | − 33.0 | − 7.4 | + 11.0 |
| | + 20.75 | − 33.33 | − 7.47 | + 11.11 |
| | ÷ .305 | ÷ .305 | − 3.74 | + 5.56 |
| | + 68.1 | − 109.3 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 75 October 7, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 21 | 31 | 25.8 | −52 15.7 |
| a. | −52 11902 | 21 | 28 | 46.3 | −52 | 18.6 | +57.6 | = 21 | 29 43.9 | −3.9 = −52 22.5 |
| b. | −52 11912 | 21 | 31 | 40.6 | −52 | 27.7 | −119.7 | = 21 | 29 42.4 | +5.4 = −52 23.1 |
| c. | −51 11705 | 21 | 31 | 26.2 | −51 | 3.2 | | | 21 29 42.6 | −52 22.8 |
| | | | × | | | | | | | |
| | | c − b = | | −14.4 | | | | | +0.7 −0.6 | +0.1 0.0 |
| | | | | .315 | | | | | | |
| | | | | −4.5 | | | | | | |

cos −51.0 / 2

| | x | y | x | y |
|---|---|---|---|---|
| a | 16.5 | 26.0 | 21.4 | 34.4 |
| b | 70.0 | 7.6 | 75.0 | 16.0 |
| n | 33.9 | 18.4 | 38.8 | 26.7 |
| | x | x | y | y |
| n − a | +17.4 | n − b − 36.1 | n − a − 7.6 | n − b + 10.8 |
| | +17.4 | −36.2 | −7.7 | +10.7 |
| | +17.4 | −36.15 | −7.65 | +10.75 |
| | +17.57 | −36.51 | −7.73 | +10.86 |
| | ÷.305 | ÷.305 | −3.86 | +5.43 |
| | +57.6 | −119.7 | | |
| | ↓ | ↓ | | |

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1909phae.proj.2302B



# A 7497 No. 76 October 7, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 Jus. | 21 31 12.4 | −52 | 15.3 |
| $a_1$ | −52 | 11902 | 21 28 46.3 | −52 | 18.6 | +43.9 | = | 21 29 32.2 | −3.4 | = −52 22.0 |
| $b_1$ | −52 | 11912 | 21 31 40.6 | −52 | 29.7 | −133.4 | = | 21 29 27.7 | +5.8 | = −52 21.98 |
| $c_1$ | −51 | 11705 | 21 31 26.2 | −51 | 3.2 | | | 21 29 28.8 | | −52 22.0 |
| | | | x | | | | | | | |
| | | | $c-b = -14.4$ | | | | | +0.6 −0.7 | | 0.0 −0.1 |

$\frac{\text{Cor} -51.0}{2}$

.315

−4.5

| | x | y | x | y |
|---|---|---|---|---|
| a | 16.5 | 26.0 | 21.4 | 34.4 |
| b | 70.0 | 7.6 | 75.0 | 16.0 |
| η | 29.7 | 19.2 | 34.7 | 27.6 |
| | x | x | y | y |
| | $\eta-a$ +13.2 | $\eta-b$ −40.3 | $\eta-a$ −6.8 | $\eta-b$ +11.6 |
| | +13.3 | −40.3 | −6.8 | +11.6 |
| | +13.25 | −40.3 | −6.8 | +11.6 |
| | +13.38 | −40.70 | −6.87 | +11.72 |
| | ÷.305 | ÷.305 | −3.44 | +5.86 |
| | +43.9 | −133.4 | | |
| | ✓ | ✓ | | |

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1909phae.proj.2302B



A 7497 No. 77 October 7, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fm. | 21 | 30 | 42.6 | −52 | 23.5 | |
| a. | −52 | 11902 | 21 | 28 | 46.3 | −52 | 18.6 | +13.5 | = 21 | 28 | 59.8 − 11.8 | = −52 | 30.3 | a. |
| b. | −52 | 11907 | 21 | 29 | 42.6 | −52 | 58.2 | −43.9 | = 21 | 28 | 58.7 + 28.8 | = −52 | 30.4 | b. |
| c. | −52 | 11908 | 21 | 30 | 8.3 | −52 | 1.3 | | | 21 | 28 58.2 | | −52 30.2 | c. |
| | | | | | | × | | | | | | | | |
| | | | | | | c − b = + 25.7 | | | | | +0.3 −0.3 | | 0.0 +0.1 | |
| Cos −52.0 | | | | | | .308 | | | | | | | | |
| | | | | | | + 7.9 | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 22.8 | 90.2 | 27.7 | 98.9 |
| b | 40.0 | 11.2 | 45.0 | 20.0 |
| η | 26.8 | 67.0 | 31.8 | 75.8 |
| | x | x | y | y |
| | η − a + 4.0 | η − b − 13.2 | η − a − 23.2 | η − b + 55.8 |
| | + 4.1 | − 13.2 | − 23.1 | + 55.8 |
| | + 4.05 | − 13.2 | − 23.15 | + 55.8 |
| | + 4.09 | − 13.33 | − 23.38 | + 56.36 |
| | ÷ .304 | ÷ .304 | − 11.69 | + 28.18 |
| | + 13.5 | − 43.9 | | |
| | √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 78. October 7, 1909.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fno. | 21 | 28 | 11.6 | -52 | 22.6 |
| a | -52 | 11893 | 21 25 32.8 | -52 | 33.6 | +54.6 | = 21 | 26 | 27.4 | +4.2 | = -52 | 29.4 |
| b | -52 | 11899 | 21 30 49.3 | -52 | 22.3 92.0 | 93.7 | = 21 | 26 | 28.8 | -6.8 | = -52 | 29.1 |
| c | -51 | 11886 | 21 25 38.2 | -51 | 51.2 | | | 21 | 26 27.4 | | -52° | 29.2 |

x

@ a = - 4.6

-0.2 +0.2 +0.2 -0.1

Cor - 51.8 / 2

.309

- 1.4

| | x | y | x | y |
|---|---|---|---|---|
| a | 25.0 | 45.0 | 30.0 | 55.5 |
| b | 69.7 | 67.0 | 74.7 | 77.5 |
| n | 41.6 | 53.3 | 46.7 | 63.8 |
| | x | x | y | y |
| | n-a +16.6 | n-b -28.1 | n-a + 8.3 | n-b -13.7 |
| | +16.7 | -28.0 | + 8.3 | -13.7 |
| | +16.65 | -28.05 | + 8.3 | -13.7 |
| | +16.82 | -28.33 | + 8.38 | -13.84 |
| | +.305 | +.305 | + 4.19 | - 6.92 |
| | +55.2 | -93.7 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 4497 No. 79 October 7, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fnm. | 21 | 26 | 55.1 | −52 | 20.3 |
| a. | −52 | 11886 | 21 | 21 | 25.3 | −52 | 40.7 | +227.2 (4.9) | = 21 | 25 | 10.2 + 1.39 = −52 26.8 |
| b. | −52 | 11896 | 21 | 26 | 20.8 | −52 | 22.6 | −69.5 (8.8) | = 21 | 25 | 12.0 − 4.4 = −52 27.0 |
| c. | −53 | 10102 | 21 | 26 | 27.9 | −53 | 23.0 | | | 21 | 25 11.8 −52 26.99 |

x

c − b = + 2.1

Cos $\frac{-53.4}{2}$

.298

+ 0.6

− 0.9 + 0.9 − 0.1 + 0.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 5.7 | 101.0 | 10.7 | 113.6 |
| b | 95.0 | 137.5 | 100.0 | 150.1 |
| n | 74.1 | 128.7 | 79.1 | 141.3 |

| x | x | y | y |
|---|---|---|---|
| n − a + 68.4 | n − b − 20.9 | n − a + 27.7 | n − b − 8.8 |
| + 68.4 | − 20.9 | + 27.7 | − 8.8 |
| + 68.4 (8) | − 20.9 | + 27.7 | − 8.8 |
| + 69.08 | − 21.11 | + 27.98 | − 8.89 |
| ÷ .304 | ÷ .304 | + 13.99 | − 4.44 |
| + 227.2 | − 69.5 | | |

✓ ✓

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1909phae.proj.2302B



A 7497 No. 80. October 7, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fm. | 21 | 25 | 31,0 | − 52 | 15.4 |
| | | | | | | | | | | 4.5 | 8.8 | | 1.8 |
| a = | − 52 | 11877 | 21 | 19 | 29.3 | − 52 | 50.6 | + 25 | 8 | = 21 | 23 | 47.X + 23.X | = − 52° | 21.5 |
| | | | | | | | | | 7.5 | | 9.0 | 1 | | 3 |
| b = | − 52 | 11897 | 21 | 26 | 56.5 | − 52 | 1.2 | − 18 | 9 | = 21 | 23 | 47.X − 21.3 | = − 52° | 22.8 |
| | | | | | | | | | | | | 6.8 | | |
| c = | − 52 | 11898 | 21 | 27 | 40.3 | − 52 | 43.0 | | | 21 | 23 | 47.X | − 52° | 22'.0 |
| | | | | | x | | | | | | | | | |
| | | | c − b = + 43.8 | | | | | | | − 2.3 | + 2.2 | | − 0.2 | + 0.3 |
| cos − 52.7 / 2 | | | | | .303 | | | | | | | | | |
| | | | | | + 13.3 | | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 14.9 | 20.6 | 20.0 | 10.4 |
| b | 150.0 | 120.5 | 155.0 | 110.2 |
| n | 92.7 | 78.3 | 97.8 / 9 | 68.0 |

| | x | x | y | y |
|---|---|---|---|---|
| | n − a + 77.8 | n − b − 57.3 | n − a + 57.7 | n − b − 42.2 |
| | + 77.8 / 9 | − 57.1 | + 57.6 | − 42.2 |
| | + 77.85 | − 57.2 | + 57.65 | − 42.2 |
| | + 78.63 | − 57.77 | + 58.23 | − 42.62 |
| | ÷ .305 | ÷ .305 | + 29.12 | − 21.31 |
| | + 257.8 | − 189.4 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



See notes by R.C.W. page –

A 7497, Star ? October 7, 1909.

This star is fairly bright

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| a. | −52 11886 | 21 21 25.3 | −52 | 40.7 | +150.7 = 21 23 56.0 | −13.2 = −52 53.9 | a. |
| b. | −52 11890 | 21 24 57.6 | −52 | 59.2 | −61.4 = 21 23 56.2 | +5.4 = −52 53.8 | b. |
| c. | −53 10084 | 21 21 47.9 | −53 | 39.1 | 21 23 56.1 | −52° 53.8 | c. |

$\frac{c_{00} - 53.6}{2}$

× c − a = + 22.6

.297

+ 6.7

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 133.5 | 25.0 | 150.0 |
| b | 83.4 | 96.8 | 88.4 | 113.3 |
| n | 65.0 | 107.4 | 70.1 | 124.0 |

| x | x | y | y |
|---|---|---|---|
| n-a + 45.0 | n-b − 18.4 | m-a − 26.1 | n-b + 10.6 |
| + 45.1 | = 18.3 | − 26.0 | + 10.7 |
| + 45.05 | − 18.35 | − 26.05 | + 10.65 |
| + 45.50 | − 18.59 | − 26.31 | + 10.76 |
| ÷ .302 | ÷ .302 | − 13.16 | + 5.38 |
| + 150.7 | − 61.4 | | |

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1909phae.proj.2302B



A 7497 No. 81. October 7, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 prec. | 21 | 18 | 25.8 | − 52 | 14.5 |
| a. | − 52 | 11864 | 21 | 15 | 2.8 | − 52 | 28.0 | + 96.7 | = 21 | 16 | 39.5 | + 7.3 | = − 52 | 20.8 |
| b. | − 52 | 11871 | 21 | 17 | 28.7 | − 52 | 16.9 | + 6.9 | = 21 | 16 | 41.8 | − 4.1 | = − 52 | 21.0 |
| c. | − 51 | 11864 | 21 | 17 | 23.4 | − 51 | 23.2 | | | 21 | 16 | 40.9 | | − 52 | 20.9 |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | − 1.1 | + 1.2 | | | − 0.1 | + 0.1 |

Cor − 51.4 / 2

c − b = − 5.3

.312

− 1.6

| | x | y | x | y |
|---|---|---|---|---|
| a | 26.2 | 22.0 | 21.2 | 14.4 |
| b | 70.0 | 44.6 | 65.0 | 36.9 |
| η | 55.7 | 36.4 | 50.7 | 28.8 |
| | x | x | y | y |
| η − a | + 29.5 | η − b − 14.3 | η − a + 14.4 | η − b − 8.2 |
| | + 29.5 | − 14.3 | + 14.4 | − 8.1 |
| | + 29.5 | − 14.3 | + 14.4 | − 8.15 |
| | + 29.80 | − 14.44 | + 14.54 | − 8.23 |
| | ÷ .305 | ÷ .305 | + 7.27 | − 4.12 |
| | + 97.7 | − 47.4 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



# A 7497 No. 82 October 8, 1909

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fno. | 21 | 15 | 5.7 | −52 | 15.3 | |
| a = | −52 | 11855 | 21 | 12 | 41.9 | −52 | 16.6 | +38.4 | = 21 | 13 | 19.9 | −4.9 | = −52 | 21.5 | a |
| b = | −52 | 11862 | 21 | 14 | 20.2 | −52 | 38.2 | −59.8 | = 21 | 13 | 20.4 | +6.8 | = −52 | 21.6 | b |
| c = | −53 | 10066 | 21 | 17 | 31.4 | −53 | 23.8 | | | 21 | 13 | 16.8 | −52° | 21.5 | c |
| | | | | | | | | | | | 20.2 | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | c − b = | + 191.2 | | | −0.3 | +0.2 | | −0.1 | 0.0 | |
| c₀₀ − 53.4 / 2 | | | | | | | .298 | | | | | | | | |
| | | | | | | | + 57.0 | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.2 | 161.7 | 20.1 | 171.1 |
| b | 45.0 | 138.6 | 50.0 | 148.0 |
| η | 26.8 | 152.0 | 31.7 | 161.3 |

| | x | x | y | y |
|---|---|---|---|---|
| η − a | +11.6 | η − b − 18.2 | η − a − 9.7 | η − b + 13.4 |
| | +11.6 | −18.3 | −9.8 | +13.3 |
| | +11.6 | −18.25 | −9.75 | +13.35 |
| | +11.7 | −18.43 | −9.85 | +13.48 |
| | ÷ .305 | ÷ .305 | −4.92 | +6.74 |
| | + 3.84 | −60.4 | | |

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1909phae.proj.2302B



A 7497 No. 83 October 8, 1909.

| | | | | | 1900 fno. | | | |
|---|---|---|---|---|---|---|---|---|
| a = -52 11914 | 21 32 48.1 | -53 27.8 | +11 18 | = | 21 | 34 | 38.8 - 6.1 | = -52 33.9 |
| b = -52 11931 | 21 37 13.6 | -52 44.4 | -15 10 | = | 21 | 34 | 35.4 + 9.8 | = -52 34.7 |
| c = -53 10141 | 21 37 26.2 | -53 40.7 | | | 21 | 34 | 37.8 | -52 34.3 |
| | | | | | | | 37.9 | 34.4 |

$\frac{c_{00} - 53.7}{2}$

x

$c_0 - b = +12.6$

.296

+3.7

| | +0.8 | -0.8 | -0.4 | +0.4 |
|---|---|---|---|---|
| | +09 | -07 | -05 | +03 |

| | x | y | x | y |
|---|---|---|---|---|
| a | 18.8 | 150.5 | 23.8 | 164.1 |
| b | 100.0 | 118.8 | 105.0 | 132.5 |
| n | 52.4 | 138.2 | 57.5 | 151.8 |

| | x | w | y | y |
|---|---|---|---|---|
| n-a | +33.6 | n-b | 47.6 n-a | -12.3 n-b +19.4 |
| | +33.7 | -47.5 | -12.3 | +19.3 |
| | +33.65 | -47.55 | -12.3 | +19.35 |
| | +33.99 | -48.03 | -12.42 | +19.54 |
| | ÷.304 | ÷.304 | -6.21 | +9.77 |
| | +111.8 | -158.0 | | |

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1909phae.proj.2302B



a 7497 No. 84 October 8, 1909.

1900 pos. 21 36 26.2 −52 28.9

| | | | | |
|---|---|---|---|---|
| a. −52 11914 | 21 32 48.1 | −52 27.8 + 11.6 | = 21 34 45 − 7.5 | = −52 35.3 |
| b. −52 11931 | 21 37 13.6 | −52 44.4 − 15.7 | = 21 34 42.9 + 8.3 | = −52 36.1 |
| c. −53 10141 | 21 37 26.2 | −53 40.7 | 21 34 43.7 | −52° 35.′7 |
| | | | 43.4 | |

x

c−b = + 12.6    +0.8 −0.8    −0.4 +0.4

cos −53.7    .296    +1.0 −0.5

+3.7

| | x | y | x | y |
|---|---|---|---|---|
| a | 18.8 | 150.5 | 23.8 | 164.1 |
| b | 100.0 | 118.8 | 105.0 | 132.5 |
| n | 54.2 | 135.5 | 59.2 | 149.2 |

| x | x | y | y |
|---|---|---|---|
| n−a + 35.4 | n−b − 45.8 | n−a − 15.0 | n−b + 16.7 |
| + 35.4 | − 45.8 | − 14.9 | + 16.7 |
| + 35.4 | − 45.8 | − 14.95 | + 16.7 |
| + 35.75 | − 46.26 | − 15.10 | + 16.87 |
| ÷ .304 | ÷ .304 | − 7.55 | + 8.44 |
| + 117.6 | − 152.2 | | |

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1909phae.proj.2302B



A 7497 No. 85 October 8, 1909.

1900 fno. 21 36 34.5 −52 25.0

a = −52 11 91 21 37 48.1 27.8 −52 55.9 +125.5 = 21 34 59.4 −4.1 = −52 31.9

b = −52 11 93 21 37 40.6 36.7 −52 XX.X −142.9 = 21 34 56.1 +5.0 = −52 31.8

c = −51 11 10 21 33 32.8 26.2 −51 58.8

21 34 51.9 59.4 −52° 31.8

+52.0

x

c − a = +151 +26.8

+0.3 −0.4 +0.1 0.0

$\frac{c_0 - 52.X}{2}$

.307

+4.7

−5.2

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 35.5 | 25.0 | 42.0 |
| b | 101.0 | 17.6 | 106.1 | 24.2 |
| 7 | 57.9 | 27.4 | 62.9 | 34.0 |

| x | x | y | y |
|---|---|---|---|
| n-a +37.9 | n-b −43.1 | n-a −8.1 | n-b +9.8 |
| +37.9 | −43.2 | −8.0 | +9.8 |
| +37.9 | −43.15 | −8.05 | +9.8 |
| +38.28 | −43.58 | −8.13 | +9.90 |
| ÷.305 | ÷.305 | −4.06 | +4.95 |
| +125.5 | −142.9 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 86 October 8, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 prec. | 21 39 | 20.9 | −52 43.6 | |
| a. | −53 10135 | 21 35 19.3 | −53 | 1.8 | +140.8 | = | 21 37 39.3 | +11.4 | = −52 50.4 | a. |
| b. | −52 11940 | 21 39 30.6 | −52 | 40.7 | −113.2 | = | 21 37 38.4 | −9.7 | = −52 50.4 | b. |
| c. | −52 11928 | 21 37 38.4 | −52 | 0.9 | | | 21 37 38.5 | | −52° 50.4 | c. |
| | | x | | | | | | | | |
| | | e−a = −44.8 | | | | | −0.2 | +0.1 | +0.1 | −0.1 |
| | e−a −52.0 / 2 | .308 / 20.0 / −28.8 | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 25.0 | 15.4 | 30.0 | 26.0 |
| b | 100.0 85.8 | 57.3 | 105.8 | 68.0 |
| η | 67.0 | 38.0 | 71.9 | 48.7 |

| x | x | y | y |
|---|---|---|---|
| η−a +42.0 | η−b −33.8 | η−a +22.6 | η−b −19.3 |
| +41.9 | −33.9 | +22.7 | −19.3 |
| +41.95 | −33.85 | +22.65 | −19.3 |
| +42.37 | −34.19 | +22.88 | −19.49 |
| ÷.302 | ÷.302 | +11.44 | −9.74 |
| +140.3 | −113.2 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 87 October 8, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fno. | 21 | 40 | 19.0 | − 52 | 33.3 |
| a. | − 52 | 11929 | 21 | 37 | 4.6 | − 52 | 8.1 | + 93.0 | = 21 | 38 | 37.8 | = − 52 | 40.4 |
| b. | − 52 | 11939 | 21 | 39 | 10.6 | − 52 | 52.7 | − 33.7 | = 21 | 38 | 37.8 | + 12.6 | = − 52 | 40.2 |
| c. | − 52 | 11933 | 21 | 37 | 36.6 | − 52 | 49.1 | | | 21 | 38 | 37.8 | | − 52° | 40.'2 |
| | | | | | × | | | | | | | | | | |
| | | | c − a = + 32.0 | | | | | | | | −0.3 | +0.2 | | −0.1 | +0.0 |
| | | | .302 | | | | | | | | | | | | |
| | | | + 9.7 | | | | | | | | | | | | |

$\frac{c_{00} - 52.8}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 40.0 | 117.0 | 45.0 | 130.6 |
| b | 78.2 | 28.3 | 83.1 | 41.7 |
| n | 68.0 | 53.1 | 73.0 | 66.6 |

| | x | x | y | y |
|---|---|---|---|---|
| n − a | + 28.0 | n − b − 10.2 | n − a − 63.9 | n − b + 24.8 |
| | + 28.0 | − 10.1 | − 64.0 | + 24.9 |
| | + 28.0 | − 10.15 | − 63.95 | + 24.85 |
| | + 28.28 | − 10.25 | − 64.39 | + 25.60 |
| | ÷ .304 | ÷ .304 | − 32.295 | + 12.555 |
| | + 93.0 | − 33.7 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 88 October 8th, 1909.

1900 prec. 21 43 49.8 -52 42.7

a - 52 11938 21 38 50.6 -52 14 9 +198.2 = 21 42 8.8 -35.9 = -52 49.5

b - 52 11945 21 42 42.1 -52 54.7 -33.7 = 21 42 8.7 + 4.9 = -52 49.8

c - 53 10148 21 38 43.2 -53 14 6 21 42 8.6 -52 49.6
7.8

c - a = - 7.4 -1.0 +0.9 -0.1 +0.2

Cos -53.2

.300

- 2.2

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 149.5 | 25.0 | 165.0 |
| b | 89.8 | 70.4 | 94.8 | 86.0 |
| n | 79.6 | 80.0 | 84.7 | 95.7 |
| | x | x | y | y |
| | n-a +59.6 | n-b -10.2 | n-a -69.5 | n-b +9.6 |
| | +59.7 | -10.1 | -69.3 | +9.7 |
| | +59.65 | -10.15 | -69.4 | +9.65 |
| | +60.25 | -10.25 | -70.09 | +9.75 |
| | ÷.304 | ÷.304 | -35.04 | +4.88 |
| | +198.2 | -33.7 | | |
| | √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 89 October 8, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fms. | 21 | 45 | 3.3 | −52 | 44.2 |
| a | −52 | 11940 | 21 | 39 | 30.6 | −52 | 40.7 | + 230.3 | = 21 | 43 | 20.9 | − 11.0 | = −52 | 51.7 |
| b | −52 | 11953 | 21 | 43 | 36.6 | −52 | 58.5 | − 194.0 | = 21 | 43 | 22.6 | + 7.8 | = −52 | 50.8 |
| C | −53 | 10151 | 21 | 39 | 24.7 | −53 | 30.1 | | 21 | 43 | 21.8 | | −52° | 51.2 |

x

C − a = − 5.9

Cor −53.5 / 2

.297

− 1.8

−0.9 + 0.8 +0.5 − 0.4

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 108.6 | 25.0 | 119.0 |
| b | 148.1 | 71.2 | 153.2 | 81.7 |
| n | 89.5 | 86.6 | 94.5 | 97.2 |
| | x | x | y | y |
| n − a | + 69.5 m − b | − 58.6 m − a | − 22.0 m − b | + 154 |
| | + 69.6 | − 58.6 | − 21.8 | + 15.5 |
| | + 69.55 | − 58.6 | − 21.9 | + 15.45 |
| | + 70.25 | − 59.19 | − 22.12 | + 15.60 |
| | ÷ .305 | ÷ .305 | − 11.06 | + 7.80 |
| | + 230.3 | − 194.0 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



# a 7497 No. 90. October 8, 1909

1900 pos. 21 46 33.8 −52 21.6

a. −52 11939 21 39 10.6 −52 52.7 + 34.5 [2.1] = 21 44 5[2.7] + 2[3.8] = −52 28.[9]

b. −52 11950 21 45 38.2 −52 23.7 − 45.[2] = 21 44 5[3.0] − 4.7 = −52 28.4

c. −51 11734 21 38 51.2 −51 46.5 21 44 5[2.8] −52° 28.6

x

$\frac{\cos -51.8}{2}$ c − a = −19.4

.309

−6.0

−0.1 +0.2 +0.3 −0.2

| | x | y | x | y |
|---|---|---|---|---|
| a | 10.0 | 30.8 | 8.0 | 31.2 |
| b | 127.7 | 87.7 | 125.8 | 88.2 |
| n | 114.0 | 78.4 | 112.0 | 78.8 |

| x | x | y | y |
|---|---|---|---|
| n−a +104.0 | n−b −13.7 | n−a +47.6 | n−b −9.3 |
| +104.0 | −13.8 | +47.6 | −9.3 |
| +104.0 | −13.75 | +47.6 | −9.3 |
| +105.04 | −13.89 | +48.08 | −9.39 |
| ÷ .304 | ÷ .304 | +24.04 | −4.695 |
| +345.5 | −45.7 | | |

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1909phae.proj.2302B



a 7497 No. 91 October 8, 1909.

1900 pos. 21 46 45.2 − 52 20.1

| | | | | | |
|---|---|---|---|---|---|
| a = −52 11939 | 21 39 10.6 | −52 52.7 | +35.X X = 21 45 X.X +25.X | = −52 27.X | |
| b = −52 11950 | 21 45 38.2 | −52 23.7 | −34.X = 21 45 4.X −3.1 | = −52 26.8 | |
| c = −51 11734 | 21 38 51.2 | −51 46.5 | 21 45 6.9 (4.2) | −52 27.0 | |

x

$\frac{\cos -51.8}{2}$ c − a = −19.4 −0.1 +0.2 +0.3 −0.3

.309

−6.0

| | x | y | x | y |
|---|---|---|---|---|
| a | 10.0 | 30.8 | 8.0 | 31.2 |
| b | 127.7 | 87.7 | 125.8 | 88.2 |
| n | 117.5 | 81.6 | 115.5 | 81.9 |

| x | x | y | y |
|---|---|---|---|
| n−a +107.5 | n−b −10.2 | n−a +50.8 | n−b −6.1 |
| +107.5 | −10.3 | +50.7 | −6.3 |
| +107.5 | −10.25 | +50.75 | −6.2 |
| +108.57 | −10.35 | +51.26 | −6.26 |
| ÷ .304 | ÷ .304 | +25.63 | −3.13 |
| +357.1 ✓ | −34.1 ✓ | | |

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1909phae.proj.2302B



α 7497 No. 92 October 8, 1909.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 pos. | 21 | 49 | 54.2 | − 52 | 30.3 |
| a. | − 52 11951 | 21 | 46 | 11.5 | − 52 | 3.0 | + 12 | 21 | 48 | 12.7 | − 52 | 34.8 |
| b. | − 53 10206 | 21 | 49 | 45.8 | − 53 | 1.7 | − 9 | 21 | 48 | 18.8 | − 52 | 37.3 |
| c. | − 53 10175 | 21 | 43 | 11.3 | − 53 | 18.7 | | 21 | 48 | 13.8 | − 52 | 37.4 |

x

c − a = − 180.2

.299

− 53.9

Cor − 53.3 / 2

− 0.5 + 0.5 + 0.1 − 0.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 60.0 | 177.2 | 59.0 | 168.4 |
| b | 124.8 | 59.3 | 123.9 | 50.5 |
| η | 97.0 | 108.0 | 96.0 | 99.3 |

| x | x | y | y |
|---|---|---|---|
| n−a + 37.0 | n−b − 27.8 | n−a − 69.2 | n−b + 48.7 |
| + 37.0 | − 27.9 | − 69.1 | + 48.8 |
| + 37.0 | − 27.85 | − 69.15 | + 48.75 |
| + 37.37 | − 28.13 | − 69.84 | + 49.24 |
| ÷ .304 | ÷ .304 | − 34.92 | + 24.62 |
| + 122.9 | − 92.5 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



# A 7497 No. 93 October 8, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 pos. | 21 | 51 | 30.4 | −52 33.5 |
| a | −52 11955 | 21 | 47 | 47.3 | −52 | 12.0 | +122.8 | = 21 | 49 | 47.8 | −29.8 = −52 40.8 |
| b | −53 10214 | 21 | 51 | 21.7 | −53 | 3.4 | −90.9 | = 21 | 49 | 50.8 | +23.2 = −52 40.4 |
| c | −53 11944 | 21 | 42 | 7.1 | −52 | 59.0 | | | 21 | 49 | 50.8 | −52 40.6 |
| | | | | x | | | | | | | |
| | | | | c − a = −340.2 | | | | | −1.6 | +1.7 | +0.2 −0.2 |
| | | | | .301 | | | | | | | |
| | | | | −102.4 | | | | | | | |

$\frac{c_{00} - 53.0}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| | 15. | | | |
| a | 130.0 | 117.8 | 110.0 | 133.5 |
| b | 179.2 | 13.6 | 174.1 | 19.9 |
| η | 151.8 | 59.5 | 146.8 | 65.8 |

| x | x | y | y |
|---|---|---|---|
| η − a + 36.8 | η − b − 27.4 | η − a − 57.6 | η − b + 45.9 |
| + 36.8 | − 27.3 | − 57.7 | + 45.9 |
| + 36.8 | − 27.35 | − 57.65 | + 45.9 |
| + 37.17 | − 27.62 | − 58.23 | + 46.36 |
| ÷ .304 | ÷ .304 | − 29.12 | + 23.18 |
| + 122.3 | − 90.9 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 94 October 9, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm, | 21 | 45 39.2 | -52 | 52.9 |
| a. | -53 | 10165 | 21 41 45.7 | -53 | 1.5 | +133.4 (2.1) | = 21 | 43 57.8 | + 1.5 = -53 | 0.0 |
| b. | -52 | 11953 | 21 46 36.6 | -52 | 58.5 | -160.6 (159.0) | = 21 | 43 57.6 | - 1.3 = -52 | 59.8 |
| c. | -51 | 11737 | 21 40 36.1 | -51 | 56.6 | | | 21 43 57.7 | | 59.9 |
| | | | x | | | | | | | |
| | | | c - a = - 69.6 | | | | | +0.1 -0.1 | | +0.1 -0.1 |
| | | | .308 | | | | | | | |
| | | | - 21.4 | | | | | | | |

cos -51.9 / 2

| | x | y | x | y |
|---|---|---|---|---|
| a | 35.0 | 15.0 | 40.0 | 25.5 |
| b | 122.6 | 30.5 | 129.6 | 31.2 |
| n | 74.8 | 18.0 | 79.7 | 28.5 |

| x | x | y | y |
|---|---|---|---|
| n-a + 39.8 | n-b - 47.8 | n-a + 3.0 | n-b - 2.5 |
| +39.7 | - 47.9 | + 3.0 | - 2.7 |
| +39.75 | - 47.85 | + 3.0 | - 2.6 |
| +40.15 | - 48.33 | + 3.03 | - 2.63 |
| ÷ .301 | ÷ .301 | + 1.52 | - 1.32 |
| +133.4 | - 160.6 | | |
| √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 95. October 9, 1909

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 21 | 39 | 50.9 | -52 | 52.6 |
| $a$ = | -52 11933 | 21 37 36.6 | -52 | 49.1 | +31.5 | = | 21 | 38 | 7.8 | -10.4 | = -52 | 59.4 |
| $b$ = | -53 10150 | 21 39 5.7 | -53 | 19.9 | -57.4 | = | 21 | 38 | 8.9 | +20.5 | = -52 | 59.4 |
| $c$ = | -53 10141 | 21 37 26.2 | -53 | 40.7 | | | 21 | 38 | 8.4 | | -52° | 59.4 |
| | | | | | | | -0.6 | | +0.5 | | 0.0 | 0.0 |

$x$

$c - a = -10.4$

$\frac{\text{Cos} -53.7}{\Sigma}$ .296

$-3.1$

| | $x$ | $y$ | $x$ | $y$ |
|---|---|---|---|---|
| $a$ | 35.0 | 115.5 | 40.0 | 130.0 |
| $b$ | 61.4 | 53.8 | 66.4 | 68.4 |
| $\eta$ | 44.3 | 94.8 | 49.4 | 109.4 |

| $x$ | $x$ | $y$ | $y$ |
|---|---|---|---|
| $\eta - a$ +9.3 | $\eta - b$ -17.1 | $\eta - a$ -20.7 | $\eta - b$ +41.0 |
| +9.4 | -17.0 | -20.6 | +41.0 |
| +9.35 | -17.05 | -20.65 | +41.0 |
| +9.44 | -17.22 | -20.86 | +41.41 |
| +.300 | +.300 | -10.43 | +20.70 |
| +31.5 | -57.4 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 96 October 9, 1909

| | | | | | | 1900 fno. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| a. | −52 | 11919 | 21 34 32.6 | −52 | 48.3 | + 33.5 = | 21 35 6.1 | −9.5 | = −52 | 57.8 |
| b. | −53 | 10135 | 21 35 19.3 | −53 | 1.8 | − 15.0 = | 21 35 4.3 | +3.6 | = −52 | 58.2 |
| c. | −52 | 11920 | 21 34 38.1 | −52 | 0.9 | | 21 35 5.3 | | −52° | 58.0 |
| | | | x | | | | | | | |
| | | | c − a = + 5.5 | | | | +0.8 | −0.8 | −0.2 | +0.2 |
| Cor | | −52.0 | .308 | | | | | | | |
| Σ | | | + 1.7 | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 30.0 | 65.0 | 35.0 | 76.5 |
| b | 44.6 | 38.8 | 49.6 | 50.2 |
| n | 40.1 | 45.9 | 45.1 | 57.4 |

| | x | x | y | y |
|---|---|---|---|---|
| n-a | + 10.1 | n-b − 4.5 | n-a − 19.1 | n-b + 7.1 |
| | + 10.1 | − 4.5 | − 19.1 | + 7.2 |
| | + 10.1 | − 4.5 | − 19.1 | + 7.15 |
| | + 10.20 | − 4.54 | − 19.29 | + 7.22 |
| | ÷ .302 | ÷ .302 | − 9.64 | + 3.61 |
| | + 33.8 | − 15.0 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 · No. 97 October 9, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 21 | 36 | 31.6 | − 52 | 57.2 | | |
| a | − 52 | 11917 | 21 | 33 | 51.6 | − 52 | 45.9 | + 56.7 | = 21 | 34 | 48.8 | − 18.2 | = − 53 4.1 |
| b | − 53 | 10133 | 21 | 34 | 57.4 | − 53 | 7.0 | − 8.0 | = 21 | 34 | 49.4 | + 3.0 | = − 53 4.0 |
| c | − 52 | 11918 | 21 | 34 | 32.1 | − 52 | 35.9 | | 21 | 34 | 48.8 | | − 53° 4.'2 |

x

c − b = − 25.3

Cor $\frac{-52.4}{2}$

.305

− 7.7

− 0.9 + 0.9 + 0.1 0.0

| | x | y | x | y |
|---|---|---|---|---|
| a | 25.6 | 68.7 | 30.7 | 82.2 |
| b | 45.0 | 76.4 | 50.0 | 40.0 |
| n | 42.6 | 32.2 | 47.6 | 45.9 |

| | x | x | y | y |
|---|---|---|---|---|
| n − a | + 17.0 | m − b − 2.4 | n − a − 36.5 | m − b + 5.8 |
| | + 16.9 | − 2.4 | − 36.3 | + 5.9 |
| | + 16.95 | − 2.4 | − 36.4 | + 5.85 |
| | + 17.12 | − 2.42 | − 36.76 | + 5.91 |
| | ÷ .302 | ÷ .302 | − 18.38 | + 2.96 |
| | + 56.7 | − 8.0 | | |
| | √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 160. October 9, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fms. | 21 | 36 | 11.6 | −52 | 50.2 |
| a. | −52 | 11917 | 21 | 33 | 51.6 | −52 | 45.9 | +36.5 | = 21 | 34 | 28.7 | − 11.2 | = −52 | 57.2 | a. |
| b. | −53 | 10133 | 21 | 34 | 57.4 | −53 | 7.0 | −28.8 | = 21 | 34 | 29.4 | +10.0 | = −52 | 58.8 | b. |
| c. | −52 | 11918 | 21 | 34 | 32.1 | −52 | 25.9 | | 21 | 34 | 28.6 | | −52° | 57.0 | c. |
| | | | | | x | | | | | | | | | | |
| | | | c − b = | | −25.3 | | | | −0.9 | | +0.8 | | +0.1 | 0.0 | |
| Cos −52.4 / 2 | | | | | .305 | | | | | | | | | | |
| | | | | | −7.7 | | | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 25.6 | 68.7 | 30.7 | 82.2 |
| b | 45.0 | 26.4 | 50.0 | 40.0 |
| n | 36.5 | 46.4 | 41.6 | 59.9 |
| | x | x | y | y |
| | n−a + 10.9 | n−b − 8.5 | n−a − 22.3 | n−b + 20.0 |
| | +10.9 | − 8.4 | −22.3 | +19.9 |
| | +10.9 | − 8.45 | −22.3 | +19.95 |
| | +11.01 | − 8.53 | −22.52 | +20.15 |
| | ÷.302 | ÷.302 | −11.26 | +10.08 |
| | +36.5 | − 28.3 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



# A 7497 No. 98 October 9, 1909.

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 1900 pos. | 21 | 35 | 57.6 | −52 | 44.2 |
| | | | | | | | | | | | | 2.6 | 15.5 | 15.9 | | 1.0 |
| a | −53 | 10125 | 21 | 31 | 52.9 | −53 | 6.9 | +144.0 | = | 21 | 34 | 44.9 | +16.0 | = −52 | 59.9 |
| | | | | | | | | 93.7 | | | | 5 | | | | |
| b | −52 | 11925 | 21 | 35 | 49.1 | −52 | 41.1 | −94.7 | = | 21 | 34 | 14.4 | −9.8 | = −52 | 50.6 |
| | | | | | | | | | | | | | 4 | | | |
| c | −52 | 11910 | 21 | 31 | 10.8 | −52 | 8.0 | | | 21 | 34 | 15.6 | | −52° | 51.0 |

×

@ − a = −42.1

.307

−12.9

Cos −52.1 / 2

+0.1 0.0 0.0 −0.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 24.5 | 25.0 | 38.9 |
| b | 91.4 | 75.6 | 96.7 | 90.1 |
| m | 63.1 | 56.0 | 68.0 | 70.6 |

| x | x | y | y |
|---|---|---|---|
| m−a + 43.1 | m−b − 28.3 | m−a + 31.5 | m−b − 19.6 |
| + 43.0 | − 28.3 | + 31.7 | − 19.5 |
| + 43.05 | − 28.3 | + 31.6 | − 19.55 |
| + 43.48 | − 28.58 | + 31.92 | − 19.75 |
| ÷ .302 | ÷ .302 | + 15.96 | − 9.88 |
| + 144.0 | − 94.7 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 99 October 9, 1909.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 1900 pos. | 21 27 32.3 | -52 54.4 | |
| a = | -52 11887 | 21 22 32.3 | -52 57.4 | +195.3 | = | 21 25 47.6 | -3.1 = -53 05 | a = |
| b = | -53 10125 | 21 31 52.9 | -53 6.9 | -36.4 | = | 21 25 45.7 | +5.3 = -53 1.5 | b = |
| c = | -52 11910 | 21 31 10.8 | -52 8.0 | | | 21 25 49.4 | -53 01.0 | c = |
| | | | | | | | 1.0 | |
| | | x | | | | | | |
| | | c - b = -42.1 | | | | -1.2 | +1.1 | -0.5 +0.6 |
| c₀₀ - 52.1 / 2 | | .307 | | | | | | |
| | | -12.9 | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 7.2 | 22.6 | 13.2 | 26.8 |
| b | 175.0 | 5.8 | 180.0 | 10.0 |
| n | 65.4 | 16.4 | 70.4 | 20.6 |

| x | x | y | y |
|---|---|---|---|
| n-a | +58.2 n-b | -109.6 n-a | -6.2 n-b +10.6 |
| +58.2 | -109.6 | -6.2 | +10.6 |
| +58.2 | -109.6 | -6.2 | +10.6 |
| +58.78 | -110.69 | -6.26 | +10.71 |
| ÷.301 | ÷.301 | -3.13 | +5.36 |
| +195.3 | -367.7 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 100 October 9, 1909.

21 27 26.2 −53 6.2

a = − 53 10092 | 21 27 28.9 | −53 17.2 + 135.8 = 21 25 40.9 − 1.5 = −53 12.7

b = − 53 01107 | 21 27 47.4 | −53 14.4 − 126.9 = 21 25 40.5 + 1.5 = −53 12.9

c = − 53 11899 | 21 27 59.8 | −53 22.3

21 25 41.4 −53° 12′.8

x

c − b = + 12.4 + 15.4

−0.5 +0.4 −0.1 +0.1

$\frac{c-a}{2} = \frac{-51.9}{2}$

.308
+ 3.8
+ 4.6

| | x | y | x | y |
|---|---|---|---|---|
| a | 12.7 | 25.9 | 17.7 | 35.4 |
| b | 90.0 | 20.0 | 95.0 | 29.5 |
| η | 52.3 | 22.9 | 57.3 | 32.4 |

| x | x | y | y |
|---|---|---|---|
| η − a + 39.6 | η − b − 37.7 | η − a − 3.0 | η − b + 2.9 |
| + 39.6 | − 37.7 | − 3.0 | + 2.9 |
| + 39.6 | − 37.7 | − 3.0 | + 2.9 |
| + 40.00 | − 38.08 | − 3.03 | + 2.93 |
| ÷ .300 | ÷ .300 | − 1.52 | + 1.46 |
| + 133.3 | − 126.9 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 101 — October 13, 1909.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 21 26 9.5 | | −53 2.7 |
| a. | −53 10088 | 21 23 8.9 | −53 13.1 | +77.1 | = | 21 24 25.0 | +4.0 | = −53 9.1 |
| b. | −52 11900 | 21 28 23.6 | −52 57.8 | −241.1 | = | 21 24 24.9 | −11.8 | = −53 9.5 |
| c. | −51 11695 | 21 28 8.5 | −51 57.5 | | | 21 24 25.0 | | −53 9.3 |
| | | | | | | +0.2 | −0.1 | −0.2 +0.2 |

$\frac{c - a}{2} = \frac{-51.9}{2}$

$c - b = -15.1$

$.308$

$-4.6$

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.5 | 18.8 | 80.5 | 29.3 |
| b | 115.0 | 50.0 | 125.0 | 60.5 |
| η | 43.4 | 26.7 | 53.4 | 37.2 |

| x | x | y | y |
|---|---|---|---|
| $n-a$ +22.9 | $n-b$ −71.6 | $n-a$ +7.9 | $n-b$ −23.3 |
| +22.9 | −71.6 | +7.9 | −23.3 |
| +22.9 | −71.6 | +7.9 | −23.3 |
| +23.13 | −72.32 | +7.98 | −23.53 |
| ÷.300 | ÷.300 | +3.99 | −11.76 |
| +77.1 | −241.1 | | |

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1900phae.proj.2302B



A 7497 No. 102 October 13, 1909.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fnom. | 21 | 24 | 32.6 | −53 | 7.5 |
| a. | −53 | 10082 | 21 | 21 | 39.4 | −53 | 16.7 | +68.5 = | 21 | 22 | 47.8 | +2.8 = −53 | 13.9 |
| b. | −53 | 10088 | 21 | 23 | 8.9 | −53 | 13.1 | −21.0 = | 21 | 22 | 47.8 | −0.9 = −53 | 14.0 |
| c. | −52 | 11889 | 21 | 33 | 29.3 | −52 | 37.4 | | 21 | 22 | 47.8 | | −53° 14.0 |
| | | | | x | | | | | | | | | |
| | | | c − b = | | +20.4 | | | | | | −0.4 | +0.5 | −0.1 0.0 |
| C00 − 52.6 / 2 | | | | | .304 | | | | | | | | |
| | | | | | +6.2 | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 18.4 | 27.7 | 23.4 | 39.3 |
| b | 45.0 | 34.9 | 50.0 | 46.6 |
| n | 38.7 | 33.1 | 43.8 | 44.8 |
| | x | x | y | y |
| | n − a +20.3 | n − b − 6.3 | n − a +5.4 | n − b − 1.8 |
| | +20.4 | − 6.2 | +5.5 | − 1.8 |
| | +20.35 | − 6.25 | +5.45 | −1.8 |
| | +20.55 | − 6.31 | +5.50 | −1.82 |
| | ÷ 300 | ÷ 300 | +2.75 | −0.91 |
| | +68.5 | − 21.0 | | |

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1909phae.proj.2302B



# a 7497 No. 103 October 13, 1909

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 pos. | 21 | 23 | 28.5 | −53 | 7.3 |
| a = | −53 | 10079 | 21 | 20 | 54.4 | −53 | 18.5 | +49.5 | = 21 | 21 | 43.4 | + 4.5 = −53 14.0 |
| b = | −53 | 10086 | 21 | 32 | 41.4 | −53 | 7.5 | −59.3 | = 21 | 21 | 42.7 | − 6.3 = −53 13.8 |
| c = | −52 | 11883 | 21 | 20 | 38.6 | −52 | 57.2 | | | 21 | 21 | 43.0 −53° 13.8 |

x

c − a = − 15.8

+0.4 −0.3 +0.2 −0.1

cos −52.9 / 2

.302

− 1.8

| | x | y | x | y |
|---|---|---|---|---|
| a | 35.0 | 30.1 | 40.0 | 38.6 |
| b | 67.3 | 51.7 | 72.3 | 60.0 |
| η | 49.7 | 39.0 | 54.7 | 47.6 |
| | x | x | y | y |
| | η − a + 14.7 | η − b − 17.6 | η − a + 8.9 | η − b − 12.7 |
| | + 14.7 | − 17.6 | + 9.0 | − 12.4 |
| | + 14.7 | − 17.6 | + 8.95 | − 12.55 |
| | + 14.85 | − 17.78 | + 9.04 | − 12.67 |
| | ÷ 300 | ÷ .300 | + 4.52 | − 6.33 |
| | + 49.5 | − 59.3 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 104 October 13, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fm. | 21 | 22 | 42.6 | −52 | 57.3 |
| a = | −52 | 11882 | 21 | 20 | 38.6 | −52 | 57.2 | +18.7 | = 21 | 20 | 57.3 | −6.8 | = −53 | 3.9 |
| b = | −53 | 10082 | 21 | 21 | 39.4 | −53 | 16.7 | −43.6 | = 21 | 20 | 56.8 | +12.9 | = −53 | 3.3 |
| c = | −52 | 11883 | 21 | 20 | 40.3 | −52 | 17.2 | | | 21 | 20 | 56.6 | | −53° | 3.8 |

$\frac{\text{Cor} - 52.3}{2}$

x

c − a = + 1.7

.306

+0.5

+0.5 −0.4 +0.1 0.0

| | x | y | x | y |
|---|---|---|---|---|
| a | 60.0 | 85.0 | 65.0 | 95.5 |
| b | 78.5 | 45.7 | 83.5 | 56.4 |
| η | 65.5 | 71.6 | 70.6 | 82.1 |

| x | x | y | y |
|---|---|---|---|
| n−a +5.5 | n−b −13.0 | n−a −13.4 | n−b +25.9 |
| +5.6 | −12.9 | −13.4 | +25.7 |
| +5.55 | −12.95 | −13.4 | +25.8 |
| +5.61 | −13.08 | −13.53 | +26.06 |
| ÷.300 | ÷.300 | −6.76 | +13.03 |
| +18.7 | −43.6 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 12 $\frac{a}{4}$? Sept. 29, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fus. | 21 | 37 | 11.8 | -50 45.2 |
| a = | -50 | 11588 | 21 | 33 | 39.5 | -50 | 39.5 | +90.8 | = 21 35 29.5 | -12.6 = -50 52.0 |
| b = | -51 | 11727 | 21 | 37 | 4.2 | -51 | 10.2 | -98.5 | = 21 35 31.6 | +18.3 = -50 52.1 |
| c = | -51 | 11718 | 21 | 34 | 22.7 | -51 | 40.5 | | 21 35 30.6 | -50 52.0 |
| | | | | | | | | | | |
| | | | c − a = | | +23.2 | | | | − 1.1 + 1.0 | 0.0 +0.1 |
| | | | | | .310 | | | | | |
| | | | | | +7.2 | | | | | |

$\frac{c_{00} - 51.7}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 165.0 | 15.0 | 155.4 |
| b | 77.5 | 103.8 | 70.5 | 94.2 |
| η | 48.3 | 140.0 | 43.4 | 130.3 |
| | x | x | y | y |
| n-a | +28.3 | n-b −29.2 | n-a −25.0 | n-b +36.2 |
| | +28.4 | −29.1 | −25.1 | +36.1 |
| | +28.35 | −29.15 | −25.05 | +36.15 |
| | +28.63 | −29.44 | −25.30 | +36.51 |
| | ÷.315 | ÷.315 | −12.65 | +18.26 |
| | +90.9 | −93.5 | | |

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1909phae.proj.2302B



a 7477 No. 105 October 13, 1909.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fno. | 21 | 20 | 15,1 | −52 | 51.0 |
| a = −52 11869 | 21 | 16 | 40.2 | −52 | 58.3 | +10 8.1 7.6 | = 21 | 18 | 29 8.3 31.0 | +1.0 | = −52 | 57.3 |
| b = −52 11882 | 21 | 20 | 38.6 | −52 | 57.2 | −12 8.9 | = 21 | 18 | 29.7 | −0.3 | = −52 | 57.5 |
| c = −52 11884 | 21 | 20 | 40.8 | −52 | 13.2 | | | 21 | 18 | 29.6 | −52° | 57.4 |
| | | | | | | | | | | | | |
| | c−b = | | +2.2 | | | | | | | −1.3 | +1.4 | −0.1 +0.1 |

(c+b)/2 − 52.2

.306

+0.7

| | x | y | x | y |
|---|---|---|---|---|
| a | 38.8 | 7.8 | 33.8 | 14.3 |
| b | 100.0 | 10.5 | 105.0 | 17.0 |
| η | 61.5 | 9.8 | 66.4 | 16.4 |

| | x | x | y | y |
|---|---|---|---|---|
| η−a | +32.7 | η−b −38.5 | η−a +2.0 | η−b −0.7 |
| | +32.6 | −38.6 | +2.1 | −0.6 |
| | +32.65 | −38.55 | +2.05 | −0.65 |
| | +32.98 | −38.93 | +2.07 | −0.66 |
| | ÷.302 | ÷.302 | +1.03 | −0.33 |
| | +109.2 | −128.9 | | |
| | ✓ | ✓ | | |

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1909phae.proj.2302B



A 7479 No. 106 October 13. 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 pro. | 21 | 16 | 15.4 | −52 | 4.9 |
| a = | −52 | 11862 | 21 | 14 | 20.2 | −52 | 28.2 | +8.5 | = 21 | 14 | 28.7 − 42.9 = −53 11.5 |
| b = | −53 | 10053 | 21 | 14 | 36.8 | −53 | 16.7 | −6.7 | = 21 | 14 | 30.2 + 44.5 = −53 11.2 |
| c = | −52 | 11871 | 21 | 17 | 28.7 | −52 | 16.9 | | | 21 | 14 29.4 −53° 11.5 |
| | | | | | x | | | | | | |
| | | | c − b = | | +171.9 | | | | | −0.8 | +0.8 −0.1 0.0 |

$\frac{c+r-52.3}{2}$

306

+52.6

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.4 | 128.3 | 20.5 | 137.7 |
| b | 20.0 | 31.5 | 25.0 | 40.8 |
| n | 18.0 | 42.6 | 23.0 | 52.0 |

| | x | x | y | y |
|---|---|---|---|---|
| n − a | + 2.6 | n − b − 2.0 | n − a − 85.7 | n − b + 11.1 |
| | + 2.5 | − 2.0 | − 85.7 | + 11.2 |
| | + 2.55 | − 2.0 | − 85.7 | + 11.15 |
| | + 2.57 | − 2.02 | − 86.56 | + 11.26 |
| | ÷ .302 | ÷ .302 | − 43.28 | + 5.63 |
| | + 8.5 | − 6.7 | | |
| | √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 107 October 13, 1909.

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 1900 | Jno. | 21 | 44 | 46.3 | − | 53 | 6.2 | | | |
| a = | −52 | 11945 | 21 | 42 | 42.1 | − 52 | 54.7 | + | 21.8 | 7.0 | = | 21 | 42 | 59.9 | − | 18.8 | = | − 53 | 13.5 |
| b = | −53 | 10175 | 21 | 43 | 11.3 | − 53 | 18.7 | − | 6.8 | 4.5 | = | 21 | 43 | 6.8 | + | 5.4 | = | − 53 | 13.3 |
| c. | −53 | 10168 | 21 | 42 | 13.2 | − 53 | 55.5 | | | | | 21 | 43 | 4.3 | | | | − 53 | 13.9 |
| | | | | | x | | | | | | | | | | | | | | |
| | | | c − a = | | − 28.9 | | | | | | | − 0.7 | + 0.7 | | | − 0.1 | + 0.2 | | |
| | | | | | .295 | | | | | | | | | | | | | | |
| | | | | | − 8.5 | | | | | | | | | | | | | | |

$\frac{c_{00} - 53.9}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 60.0 | 135.0 | 65.0 | 146.4 |
| b | 66.4 | 81.1 | 71.4 | 98.5 |
| 7 | 65.1 | 99.9 | 70.0 | 109.2 |

| | x | x | y | y |
|---|---|---|---|---|
| | m − a | m − b | m − a | m − b |
| | + 6.5 | − 1.8 | − 37.1 | + 10.7 |
| | + 6.4 | − 2.0 | − 37.2 | + 10.7 |
| | + 6.45 | − 1.9 | − 37.15 | + 10.75 |
| | + 6.51 | − 1.96 | − 37.52 | + 10.86 |
| | ÷ .300 | ÷ .300 | − 18.76 | + 5.43 |
| | + 21.7 | − 6.4 | | |

Not correct made in writing - have remembered it.

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1909phae.proj.2302B



A 7497 No. 108. October 14, 1909

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 Jan. | 21 43 12.7 | -53 | 10.2 | |
| a = | -53 10148 | 21 38 43.2 | -53 | 14.6 | +168.2 (6.5) | = | 21 41 29.7 − 2.5 | = -53 | 17.1 | a = |
| b = | -53 10175 | 21 43 11.3 | -53 | 18.7 | −101.5 (0) | = | 21 41 30.8 + 1.6 | = -53 | 17.1 | b = |
| c = | -52 11938 | 21 38 50.6 | -52 | 14.9 | | | 21 41 30.2 | -53° | 17.1 | c = |
| | | x | | | | | | | | |
| | | c − a = + 7.4 | | | | | − 0.5 + 0.6 | 0.0 | 0.0 | |

Cos − 53.2 / I

.306

+ 2.3

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 41.0 | 20.0 | 50.5 |
| b | 94.9 | 32.7 | 99.8 | 42.3 |
| η | 64.8 | 36.0 | 69.8 | 45.5 |

| | x | x | y | y |
|---|---|---|---|---|
| η − a | + 49.8 | η − b − 30.1 | η − a − 5.0 | η − b + 3.3 |
| | + 49.8 | − 30.0 | − 5.0 | + 3.2 |
| | + 49.8 | − 30.05 | − 5.0 | + 3.25 |
| | + 50.20 | − 30.35 | − 5.05 | + 3.28 |
| | ÷ .299 | ÷ .299 | − 2.52 | + 1.64 |
| | + 168.2 | − 101.5 | | |
| | / | / | | |

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1909phae.proj.2302B



a 7497 No. 109. October 14, 1909.

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 1900 | fno. | 21 | 43 | 3.9 | | −53 | 8.1 |
| a = | −53 | 10160 | 21 | 40 | 38.4 | −53 | 36.7 | + | 57.4 | = | 21 | 41 | 35.6 | + | 21.4 | = | −53 | 15.5 |
| b = | −52 | 11944 | 21 | 42 | 7.1 | −52 | 59.0 | − | 39.2 | = | 21 | 41 | 27.9 | − | 16.7 | = | −53 | 15.5 |
| c = | −52 | 11940 | 21 | 40 | 39.6 | −51 | 40.7 | | | | 21 | 41 | 31.8 | | | | −53° | 15.5 |
| | | | | | | | | | | | | | 21.4 | | | | | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | |
| a − a = | | | | | −67.6 | | | | | | | | −0.2 | + | 0.1 | | | −0.1 | + 0.1 |

Cor −52.7

303

13.7

| | x | y | x | y |
|---|---|---|---|---|
| a | 25.0 | 27.7 | 30.0 | 38.0 |
| b | 53.6 | 103.1 | 58.6 | 113.5 |
| n | 42.0 | 70.0 | 47.0 | 80.4 |

error in the identification of a

| x | x | y | y |
|---|---|---|---|
| n−a + 17.0 | n−b − 11.6 | n−a + 42.3 | n−b − 33.1 |
| + 17.0 | − 11.6 | + 42.4 | − 33.1 |
| + 17.0 | − 11.6 | + 42.35 | − 33.1 |
| + 17.17 | − 11.72 | + 42.77 | − 33.43 |
| ÷ .299 | ÷ .299 | + 21.38 | − 16.72 |
| + 57.4 | − 39.2 | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 30.0 | 29.3 | 35.0 | 38.0 |
| b | 63.2 | 102.8 | 68.3 | 111.6 |
| n | 49.6 | 70.6 | 54.6 | 79.3 |

| x | x | y | y |
|---|---|---|---|
| n−a + 19.6 | n−b − 13.6 | n−a + 41.3 | n−b − 32.2 |
| + 19.6 | − 13.7 | + 41.3 | − 32.3 |
| + 19.6 | − 13.65 | + 41.3 | − 32.25 |
| + 19.80 | − 13.79 | + 41.71 | − 32.57 |
| ÷ .299 | ÷ .299 | + 20.86 | − 16.28 |
| + 66.2 | − 46.1 | | |

✓ ✓

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Note – see page 126 for measurement of this neb. new stars selected –

A7497 No. 110 October 14, 1909.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a = | −53 | 10117 | 21 | 30 | 4.4 | −53 | 20.7 | +264.8 | = 21 | 34 | 28.2 | +5.1 | = −53 | 15.6 |
| b = | −53 | 10154 | 21 | 39 | 45.2 | −53 | 7.5 | −320.0 | = 21 | 34 | 28.2 | −6.0 | = −53 | 13.5 |
| c = | −52 | 11909 | 21 | 30 | 49.8 | −52 | 32.9 | | 21 | 34 | 27.4 | | −53 | 14.6 |
| | | | | | | | | | | | | | | |
| | | | c − a = + 44.9 | | | | | | −1.0 | +1.0 | | +1.0 | −1.1 | |

$\frac{c\alpha - 52.5}{2}$

.304

+ 13.6

| | x | y | x | y |
|---|---|---|---|---|
| a | 10.0 | 14.4 | 15.0 | 21.9 |
| b | 183.6 | 36.7 | 188.7 | 44.4 |
| n | 88.6 | 24.6 | 93.6 | 32.2 |

| | x | x | y | y |
|---|---|---|---|---|
| n − a | + 78.6 | n − b − 95.0 | n − a + 10.2 | n − b − 12.1 |
| | + 78.6 | − 95.1 | + 10.3 | − 12.2 |
| | + 78.6 | − 95.05 | + 10.25 | − 12.15 |
| | + 79.39 | − 96.00 | + 10.35 | − 12.27 |
| | ÷ .300. | ÷ .300 | + 5.18 | − 6.14 |
| | + 264.8 | − 320.0 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



Note – see page 127 for measurement of this neb – new stars selected.

A7497 No. 111 October 14, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a = | −53 | 10117 | 21 | 30 | 4.4 | −53 | 20.7 | + 23 6.6 | = 21 | 34 1.0 | + 4.3 | = −53 | 16.4 |
| b = | −53 | 10154 | 21 | 39 | 45.2 | −53 | 7.5 | − 34 2.1 | = 21 | 33 4 3.1 | − 7.6 | = −53 | 14.5 4 |
| c = | −52 | 11909 | 21 | 30 | 49.3 | −51 | 32.9 | | 21 | 34 2.0 | | −53° | 15.4 |

× Cos −52.5°

c − a = + 44.9

.304

+ 13.6

−1.0 +1.1 +1.0 −1.0

| | x | y | x | y |
|---|---|---|---|---|
| a | 10.0 | 14.4 | 15.0 | 21.9 |
| b | 183.6 | 36.7 | 188.7 | 44.4 |
| n | 81.0 | 22.9 | 86.0 | 30.5 |

| | x | x | y | y |
|---|---|---|---|---|
| n − a | +71.0 | n − b −102.6 | n − a + 8.5 | n − b − 13.8 |
| | +71.0 | −102.7 | + 8.6 | − 13.9 |
| | +71.0 | −102.65 | + 8.55 | − 13.85 |
| | +71.71 | −103.6 8/7 | + 8.63 | − 13.99 |
| | ÷ .300 | ÷ .300 | + 4.32 | − 6.995 |
| | + 239.0 | −345.6 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



# A7497 No. 112 October 14, 1909

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fno. | 21 | 34 | 59.9 | −52 | 14.1 | | |
| a = | −53 | 10117 | 21 | 30 | 4.4 | −53 | 20.7 | +192.0 | = 21 | 33 | 15.4 | +0.0 | = −53 | 20.7 | a = |
| b = | −53 | 10150 | 21 | 39 | 5.7 | −53 | 19.9 | −351.0 | = 21 | 33 | 14.7 | +1.2 | = −53 | 21.1 | b = |
| c = | −52 | 11909 | 21 | 30 | 49.3 | −52 | 32.9 | | | 21 | 33 | 15.6 | | −53° | 20.9 | c = |

0.1 145 347.5 8.2 16.4

x

c − a = +44.9

−1.9 +1.8 −0.2 +0.2

Cos − 52.5 / 2

.304

+13.6

| | x | y | x | y |
|---|---|---|---|---|
| a | 10.0 | 12.2 | 15.0 | 20.7 |
| b | 170.8 | 10.0 | 175.7 | 18.4 |
| n | 66.9 | 12.4 | 71.8 | 20.7 |
| | x | x | y | y |
| | n−a +56.9 | n−b −103.9 | n−a +0.2 | n−b +2.4 |
| | +56.8 | −103.9 | +0.0 | +2.3 |
| | +56.85 | −103.9 | +0.1 | +2.35 |
| | +57.32 | −104.94 | +0.1 | +2.37 |
| | ÷.299 | ÷.299 | +0.05 | +1.18 |
| | +192.0 | −351.0 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A7497 No. 113 October 14, 1909. 21h 15m

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 prec. | 21 | 34 | 56.4 | − 53 | 11.2 |
| a: | − 53 | 10125 | 21 | 31 52.9 | − 53 | 6.9 | + 79.5 | = 21 | 33 124 | 18.4 − 11.1 | = − 53 18.3 |
| b: | − 53 | 10127 | 21 | 33 37.9 | − 53 | 21.2 | − 26.5 | = 21 | 33 13.4 | + 3.2 | = − 53 18.0 |
| c: | − 53 | 11915 | 21 | 33 21.6 | − 53 | 14.7 | | 21 | 33 13.9 | 18.1 | − 53 18.0 |
| | | | | x | | | | | | −0.5 | +0.5 0.0 0.0 |

c − b = − 16.3

Corr. − 52.2 / 2

.306

− 5.0

| | x | y | x | y |
|---|---|---|---|---|
| a | 23.8 | 54.1 | 28.8 | 65.6 |
| b | 55.0 | 25.4 | 60.0 | 37.0 |
| n | 47.6 | 31.8 | 52.7 | 43.4 |

| x | x | y | y |
|---|---|---|---|
| n−a + 23.8 | n−b − 7.4 | n−a − 22.3 | n−b + 6.4 |
| + 23.9 | − 7.3 | − 22.2 | + 6.4 |
| + 23.85 | − 7.35 | − 22.25 | + 6.4 |
| + 24.09 | − 7.42 | − 22.47 | + 6.46 |
| ÷ .300 | ÷ .300 | − 11.24 | + 3.23 |
| + 80.3 | − 24.7 | | |

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1909phae.proj.2302B



A 7497 No. 114 October 15, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fro. | 21 | 21 | 49.1 | −53 | 21.0 |
| a = | −53 | 10073 | 21 | 19 | 35.4 | −53 | 21.6 | + 28.5 | = 21 | 20 | 3.8 − 5.9 = −53 | 27.5 |
| b = | −53 | 10076 | 21 | 20 | 19.4 | −53 | 31.3 | − 16.6 | = 21 | 20 | 3.8 + 3.8 = −53 | 27.5 |
| c = | −52 | 11883 | 21 | 20 | 40.3 | −52 | 17.2 | | 21 | 20 | 3.4 | −53° 27.5 |
| | | | | | x | | | | | | |
| | | | c − b = + 20.9 | | | | | | +0.3 | −0.3 | 0.0 | 0.0 |

$\frac{C_{52} - 52.3}{2}$

.306

+ 6.4

| | x | y | x | y |
|---|---|---|---|---|
| a | 26.7 | 39.8 | 31.7 | 47.6 |
| b | 40.0 | 20.4 | 45.0 | 28.0 |
| n | 35.1 | 28.0 | 40.1 | 35.5 |

| x | x | y | y |
|---|---|---|---|
| n−a + 8.4 | n−b − 4.9 | n−a − 11.8 | n−b + 7.6 |
| + 8.4 | − 4.9 | − 12.1 | + 7.5 |
| + 8.4 | − 4.9 | − 11.95 | + 7.55 |
| + 8.48 | − 4.95 | − 12.07 | + 7.63 |
| ÷ .298 | ÷ .298 | − 6.04 | + 3.82 |
| + 28.5 | − 16.6 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 115 October 15, 1909.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fm. | 21 | 32 | 23.0 | −53 | 46.4 |
| a = | −58 4 9903 10136 | 21 | 28 | 10.3 | −54 | 6.9 | +148.9 7.4 | = 21 | 30 | 39.2 7.7 | +13.6 | = −53 | 53.2 |
| b = | −57 3 10136 9903 | 21 | 33 | 8.4 | −53 | 39.0 | −151.3 149.8 | = 21 | 30 | 37.1 8.6 | −14.0 3.9 | = −53 | 58.1 2.9 |
| c = | −57 3 | 10107 | 21 | 27 | 47.4 | −53 | 144 | | 21 | 30 | 38.2 | | −53° | 53.1 |
| | | | x | | | | | | | | | | | |
| | | | c − a = −22.9 | | | | | | −0.5 | +0.4 | | | +0.2 | −0.2 |
| Cos −53.2 / 2 | | | .300 | | | | | | | | | | | |
| | | | −6.9 | | | | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 14.5 | 25.0 | 21.0 |
| b | 107.7 | 69.4 | 112.7 | 75.8 |
| η | 63.5 | 44.6 | 68.5 | 48.1 |

| x | x | y | y |
|---|---|---|---|
| η − a + 43.5 | η − b − 44.2 | η − a + 27.1 | η − b − 27.8 |
| + 43.5 | − 44.2 | + 27.1 | − 27.7 |
| + 43.5 | − 44.2 | + 27.1 | − 27.75 |
| + 43.9 4 | − 44.64 | + 27.37 | − 28.03 |
| ÷ .295 | ÷ .295 | + 13.68 | − 14.02 |
| + 148.9 | − 151.3 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A7497 No. 116 October 15, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 21 | 23 | 44.8 | -53 | 35.9 |
| a = | -53 | 10081 | 21 | 21 | 31.4 | -53 | 41.5 | +27.4 = | 21 | 21 | 58.8 − 1.1 = | -53 | 42.6 |
| b = | -53 | 10098 | 21 | 26 | 1.4 | -53 | 54.1 | −24.8 = | 21 | 21 | 56.6 + 11.8 = | -53 | 42.8 |
| @ = | -52 | 11886 | 21 | 21 | 25.3 | -52 | 40.7 | | 21 | 21 | 58.8 | -53° | 42.4 |
| | | | | | x | | | | | | |
| | | | @ − a = | | − 6.1 | | | | − 0.3 | | + 0.2 | | + 0.2 − 0.1 |

@@a − 52.7
I

.303
− 1.8

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 39.9 | 20.0 | 50.5 |
| b | 94.5 | 14.3 | 99.5 | 24.7 |
| η | 23.0 | 37.7 | 28.0 | 48.3 |

| | x | x | y | y |
|---|---|---|---|---|
| η − a | + 8.0 | η − b − 71.5 | η − a − 2.2 | η − b + 23.4 |
| | + 8.0 | − 71.5 | − 2.2 | + 23.6 |
| | + 8.0 | − 71.5 | − 2.2 | + 23.5 |
| | + 8.08 | − 72.22 | − 2.22 | + 23.74 |
| | ÷ .295 | ÷ .295 | − 1.11 | + 11.87 |
| | + 27.4 | − 244.8 | | |
| | √ | √ | | |

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1909phae.proj.2302B



# A 7497 No. 117 October 15, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 21 | 47 | 42.7 | -53 | 56.5 |
| a = | -53 | 10168 | 21 | 42 | 13.2 | -53 | 55.3 | + 22.8 | = 21 | 46 | 56.0 | -8.5 | = -54 | 3.8 |
| b = | -54 | 9977 | 21 | 48 | 18.2 | -54 | 7.4 | - 13.5 | = 21 | 45 | 59.9 | +4.2 | = -54 | 3.2 |
| c = | -54 | 9954 | 21 | 40 | 8.1 | -54 | 45.2 | | | 21 | 46 | 0.2 | | -54 | 3.5 |
| | | | | x | | | | | | | | | | |
| | | | | c - a = -125.1 | | | | | | -1.0 | + 1.1 | | | + 0.3 - 0.3 |

$\frac{\text{Cos} -54.7}{\Sigma}$ .289

-36.2

| | x | y | x | y |
|---|---|---|---|---|
| a | 50.0 | 116.3 | 55.0 | 109.0 |
| b | 156.7 | 90.8 | 161.7 | 83.6 |
| n | 116.4 | 99.2 | 121.5 | 92.0 |
| | x | x | y | y |
| | n-a + 66.4 | n-b - 40.3 | n-a - 17.1 | n-b + 8.4 |
| | + 66.5 | - 40.2 | - 17.0 | + 8.4 |
| | + 66.45 | - 40.25 | - 17.05 | + 8.4 |
| | + 67.11 | - 40.65 | - 17.22 | + 8.48 |
| | ÷ .294 | ÷ .294 | - 8.61 | + 4.24 |
| | + 228.3 | - 188.3 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 118 October 15, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 pos. | 21 | 40 | 20.7 | −54 | 4.7 |
| a = | −54 | 99.42 | 21 | 37 | 34.1 | −54 | 5.2 | +6 | 2.9 3.5 | = 21 | 38 | 37.0 | −6.5 | = −54 | 11.8 |
| b = | −54 | 99.53 | 21 | 40 | 1.6 | −54 | 20.4 | −8 | 5.1 4.9 | = 21 | 38 | 37.5 | +8.9 | = −54 | 11.5 |
| c = | −52 | 119.32 | 21 | 37 | 19.7 | −52 | 58.7 | | | | 21 | 38 | 37.2 36.6 | | −54° | 11.6 |
| | | | | | | | | | | | | | | | |
| | | | | | c − a = | − 14.4 | | | | | − 0.2 | + 0.3 | | + 0.1 | − 0.1 |
| | | | | | | .301 | | | | | | | | | |
| | | | | | | − 4.3 | | | | | | | | | |

$\frac{c+a}{2} - 53.0$

| | x | y | x | y |
|---|---|---|---|---|
| a | 30.0 | 38.9 | 35.0 | 45.3 |
| b | 73.2 | 8.0 | 78.2 | 14.5 |
| n | 48.3 | 25.9 | 53.4 | 32.3 |
| | x | x | y | y |
| | n − a + 18.3 | n − b − 24.9 | n − a − 13.0 | n − b + 17.9 |
| | + 18.4 | − 24.8 | − 13.0 | + 17.8 |
| | + 18.35 | − 24.85 | − 13.0 | + 17.85 |
| | + 18.53 | − 25.10 | − 13.13 | + 18.03 |
| | ÷ .292 | ÷ .292 | − 6.56 | + 9.02 |
| | + 63.5 | − 86.0 | | |
| | √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 119 October 16, 1909.

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fno. | 21 | 39 | 57.1 | − | 54 | 4.0 | |
| a = | −54 | 9942 | 21 | 37 | 34.1 | − 54 | 5.2 | +33.9 | = 21 | 38 | 13.0 | −5.6 | = −54 | 10.8 | |
| b = | −54 | 9948 | 21 | 38 | 46.6 | − 54 | 13.7 | −33.8 | = 21 | 38 | 13.8 | +3.0 | = −54 | 10.7 | |
| c = | −52 | 11932 | 21 | 37 | 19.7 | − 52 | 58.7 | | | | 13.4 | | | | |
| | | | | | | | | | 21 | 38 | 13.4 | | −54° | 10.8 | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | −0.3 | +0.3 | | | 0.0 | −0.1 | |

$\frac{c_{00} - 53.0}{2}$

c − a = − 14.4

.301

− 4.33

| | x | y | x | y |
|---|---|---|---|---|
| a | 25.0 | 35.8 | 30.0 | 46.0 |
| b | 46.0 | 18.7 | 51.1 | 28.8 |
| η | 36.4 | 24.6 | 41.4 | 34.7 |

| x | x | y | y |
|---|---|---|---|
| η−a + 11.4 | η−b − 9.6 | η−a − 11.2 | η−b + 5.9 |
| +11.4 | − 9.7 | − 11.3 | + 5.9 |
| +11.4 | − 9.65 | − 11.25 | + 5.9 |
| +11.51 | − 9.75 | − 11.36 | + 5.96 |
| ÷ .293 | ÷ .293 | − 5.68 | + 2.98 |
| + 39.3 | − 33.3 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A7497 No. 120. October 16, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fno. | 21 | 39 | 11.2 | -54 3.8 |
| a. | -54 | 9938 | 21 | 36 | 26.7 | -54 | 7.9 | +60.8 | = 21 37 27.0 | -2.7 | = -54 10.6 |
| b. | -54 | 9948 | 21 | 38 | 46.6 | -54 | 13.7 | -80.4 | = 21 37 22.2 | +3.2 | = -54 10.5 |
| @. | -52 | 11928 | 21 | 36 | 39.6 | -52 | 53.7 | | 21 37 24.9 | | -54° 10.6 |

x

@ - a = +12.9

cos -51.9 / x

.302

+ 3.9

0.0 0.0 0.0 -0.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 25.0 | 29.9 | 30.0 | 23.5 |
| b | 65.8 | 18.1 | 70.9 | 11.7 |
| η | 42.6 | 24.5 | 47.6 | 18.1 |

| x | x | y | y |
|---|---|---|---|
| η-a + 17.6 | η-b - 23.2 | η-a - 5.4 | η-b + 6.4 |
| + 17.6 | - 23.3 | - 5.4 | + 6.4 |
| + 17.6 | - 23.25 | - 5.4 | + 6.4 |
| + 17.78 | - 23.48 | - 5.45 | + 6.46 |
| ÷ .292 | ÷ .292 | - 2.72 | + 3.23 |
| + 60.9 | - 80.4 | | |
| √ | √ | | |

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1909phae.proj.2302B



# a 7497 No. 121 October 16, 1909

| | | | | | 1900 fno. | 21 28 44.8 | −53 56.0 |
|---|---|---|---|---|---|---|---|
| a = −54 9938 | 21 36 26.7 | −54 7.9 | +34.4 | = | 21 37 0.8 | +5.2 | = −54 2.8 |
| b = −53 10142 | 21 37 30.4 | −53 59.5 | −29.9 | = | 21 37 0.8 | −3.4 | = −54 2.9 |
| c = −52 11928 | 21 36 39.6 | −52 53.7 | | | 21 37 0.8 | | −54° 2.8 |
| | x | | | | | | |
| | c − a = +12.9 | | | | 0.0 | 0.0 | 0.0 +0.1 |
| (c0 − 52.9)/2 | .302 | | | | | | |
| | +3.9 | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 30.0 | 23.5 | 35.0 | 32.0 |
| b | 48.7 | 40.6 | 53.7 | 49.2 |
| η | 40.0 | 33.8 | 45.0 | 42.4 |
| | x | x | y | y |
| | η−a +10.0 | η−b −8.7 | η−a +10.3 | η−b −6.8 |
| | +10.0 | −8.7 | +10.4 | −6.8 |
| | +10.0 | −8.7 | +10.35 | −6.8 |
| | +10.10 | −8.79 | +10.45 | −6.87 |
| | ÷.294 | ÷.294 | +5.22 | −3.44 |
| | +34.4 | −29.9 | | |
| | ✓ | ✓ | | |

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1909phae.proj.2302B



A 7497 No. 122 October 16, 1909

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fro. | 21 33 | 33.7 | -54 0.5 |
| a. | -54 9917 | 21 31 41.3 | -54 | 4.3 | +6.8 | = 21 31 | 48.8 − 3.0 | = -54 | 7.3 |
| b. | -54 9919 | 21 32 52.8 | -54 | 29.9 | -63.6 | = 21 31 | 49.8 + 22.7 | = -54 | 7.2 |
| c. | -57 10125 | 21 31 27.6 | -57 | 55.3 | | 21 31 | 48.9 | -54 | 7.2 |

c − a = + 11.6 + 13.4 = + 25.0

.302

+ 3.5

+ 4.4

3.1

Coo − 57.9 / 2

| | | | | | |
|---|---|---|---|---|---|
| | | x | y | x | y |
| a | | 20.0 | 55.4 | 25.0 | 65.0 |
| b | | 40.3 | 4.2 | 45.4 | 13.6 |
| η | | 21.9 | 48.95 | 27.0 | 59.0 |

| | x | x | y | y |
|---|---|---|---|---|
| η − a | + 1.9 η − b | − 18.4 η − a | − 5.9 η − b | + 45.3 |
| | + 2.0 | − 18.4 | − 6.0 | + 45.4 |
| | + 1.95 | − 18.4 | − 5.95 | + 45.35 |
| | + 1.97 | − 18.58 | − 6.01 | + 45.80 |
| | ÷ .292 | ÷ .292 | − 3.00 | + 22.90 |
| | + 6.8 | − 63.6 | | |
| | √ | √ | | |

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1909phae.proj.2302B



Q 7497 No. 123. October 16, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 21 | 32 | 55.2 | -54 | 2.5 | | |
| a. | -54 9902 | 21 | 37 | 59.3 | -54 | 32.0 | + 192.8 | = 21 | 31 | 9.7 | + 23.0 | = -54 | 9.2 |
| b. | -54 9916 | 21 | 31 | 39.3 | -54 | 6.0 | - 28.4 | = 21 | 31 | 11.2 | - 3.2 | = -54 | 9.2 |
| c. | -53 10107 | 21 | 27 | 47.4 | -53 | 14.4 | | | 21 | 31 | 10.4 | | -54° 9.2 |
| | | | | x | | | | | | | | | |
| | | c - a = - 11.9 | | | | | | | | - 0.7 | + 0.8 | 0.0 | 0.0 |
| cos -53.2 / 2 | | .300 | | | | | | | | | | | |
| | | - 3.6 | | | | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 16.0 | 25.0 | 26.5 |
| b | 83.8 | 67.8 | 88.8 | 78.3 |
| m | 75.6 | 61.5 | 80.6 | 72.0 |

| x | x | y | y |
|---|---|---|---|
| m-a + 55.6 | m-b - 8.2 | m-a + 45.5 | m-b - 6.3 |
| + 55.6 | - 8.2 | + 45.5 | - 6.3 |
| + 55.6 | - 8.2 | + 45.5 | - 6.3 |
| + 56.16 | - 8.28 | + 45.96 | - 6.36 |
| + .292 | + .292 | + 22.98 | - 3.18 |
| + 192.3 | - 28.4 | | |
| ∫ | ∨ | | |

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1909phae.proj.2302B



A 74 No. 110 October 15, 1909

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 1900 fm. | 21 | 36 | 13.0 | − | 53 | 8.2 | | |
| a = | − 53 | 10126 | 21 | 33 | 8.4 | − 53 | 39.0 | + 81.7 | = | 21 | 34 | 29.3 | + 34.2 | = | − 53 | 15.0 | | a = |
| b = | − 53 | 10133 | 21 | 34 | 57.4 | − 53 | 7.0 | − 27.5 | = | 21 | 34 | 30.2 | − 8.0 | = | − 53 | 15.0 | | b = |
| c = | − 52 | 11915 | 21 | 33 | 21.6 | − 52 | 14.7 | | | 21 | 34 | 29.8 | | | − 53 | 15.0 | | c = |
| | | | | | | | | | | − 0.5 | | | + 0.4 | | 0.0 | 0.0 | | |

c − a = + 13.2

.306

+ 4.0

Cos − 52.2 / I

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 4.9 | 25.0 | 14.5 |
| b | 52.2 | 68.9 | 57.2 | 58.4 |
| η | 44.1 | 52.9 | 49.1 | 62.2 |

| | x | x | y | y |
|---|---|---|---|---|
| η − a | + 24.1 | η − b − 8.1 | η − a + 48.0 | η − b − 16.0 |
| | + 24.1 | − 8.1 | + 47.7 | − 16.2 |
| | + 24.1 | − 8.1 | + 47.85 | − 16.1 |
| | + 24.34 | − 8.18 | + 48.33 | − 16.26 |
| | ÷ .298 | ÷ .298 | + 24.16 | − 8.13 |
| | + 81.7 | − 27.5 | | |
| | √ | √ | | |

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1909phae.proj.2302B



a 74 97 No. 111 October 15, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fm. | 21 | 35 | 48.0 | -53 | 9.2 |
| a = | -53 | 10127 | 21 | 33 | 37.9 | -53 | 21.2 | +26.9 | = 21 | 34 | 48.5 | +5.3 | = -53 15.9 |
| b = | -53 | 10133 | 21 | 34 | 57.4 | -53 | 7.0 | -52.9 | = 21 | 34 | 45.0 | -9.0 | = -53 16.0 |
| c = | -52 | 11916 | 21 | 33 | 40.6 | -52 | 11.9 | | | 21 | 34 | 4.8 | -53° 16.0 |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | -0.3 | +0.2 -0.1 0.0 |

$\frac{c_{00} - 52.2}{2}$

c - a = + 2.7

.306

+ 0.8

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 15.0 | 25.0 | 25.4 |
| b | 43.7 | 43.7 | 48.7 | 54.2 |
| η | 28.0 | 25.7 | 33.0 | 36.2 |

| x | | x | | y | | y | |
|---|---|---|---|---|---|---|---|
| n-a | + 8.0 | n-b | - 15.7 | n-a | + 10.7 | n-b | - 18.0 |
| | + 8.0 | | - 15.7 | | + 10.8 | | - 18.0 |
| | + 8.0 | | - 15.7 | | + 10.75 | | - 18.0 |
| | + 8.08 | | - 15.86 | | + 10.86 | | - 18.18 |
| | ÷ .300 | | ÷ .300 | | + 5.43 | | - 9.09 |
| | + 26.9 | | - 52.9 | | | | |
| | ✓ | | ✓ | | | | |

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1909phae.proj.2302B



A7497 No. 124 October 16, 1909.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fmn. | 21 32 | 19.6 | -54 5.6 |
| a. | -54 | 9902 | 21 27 59.3 | -54 | 32.0 | + 15 5.4 | = 21 30 34.7 | + 19.6 | = -54 12.4 |
| b. | -54 | 9917 | 21 31 41.3 | -54 | 4.3 | - 6 6.8 | = 21 30 34.5 | - 7.9 | = -54 12.2 |
| c. | -53 | 10107 | 21 27 47.4 | -53 | 14.4 | | 21 30 34.6 | | -54° 12.3 |

x

c - a = - 11.9

.300

- 3.6

+0.1 -0.1 +0.1 -0.1

Cos -53.2 / 2

| | x | y | x | y |
|---|---|---|---|---|
| a | 25.0 | 26.5 | 30.0 | 15.0 |
| b | 89.9 | 81.6 | 94.9 | 70.1 |
| n | 70.4 | 65.7 | 75.4 | 54.2 |

| x | x | y | y |
|---|---|---|---|
| n-a + 45.4 | n-b - 19.5 | n-a + 39.2 | n-b - 15.9 |
| + 45.4 | - 19.5 | + 39.2 | - 15.9 |
| + 45.4 | - 19.5 | + 39.2 | - 15.9 |
| + 45.85 | - 19.70 | + 39.59 | - 16.06 |
| ÷ .292 | ÷ .292 | + 19.795 | - 8.03 |
| + 157.0 | - 67.5 | | |
| √ | √ | | |

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1909phae.proj.2302B



A 7497 No. 125 October 16, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 21 | 31 | 48.6 | − 54 | 1.7 |
| a = −54 9911 | 21 | 29 | 46.8 | − 54 | 8.8 | + 16.4 = | 21 | 30 | 3.2 | + 0.4 = | − 54 8.4 |
| b. −54 9920 | 21 | 33 | 17.8 | − 54 | 4.9 | − 195.3 = | 21 | 30 | 4.5 | − 3.5 = | − 54 8.4 |
| c = −52 11907 | 21 | 29 | 42.6 | − 52 | 58.2 | | 21 | 30 | 3.8 | | − 54° 8.4 |
| | | | | | | | | | | − 0.8 | + 0.7 0.0 0.0 |

c − a = − 4.2

.301

− 1.3

Corr − 53.0 / 2

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 30.5 | 25.0 | 37.0 |
| b | 81.4 | 38.2 | 86.4 | 44.8 |
| n | 24.7 | 31.3 | 29.8 | 37.8 |

| x | x | y | y |
|---|---|---|---|
| n-a + 4.7 | n-b − 56.7 | n-a + 0.8 | n-b − 6.9 |
| + 4.8 | − 56.6 | + 0.8 | − 7.0 |
| + 4.75 | − 56.65 | + 0.8 | − 6.95 |
| + 4.80 | − 57.22 | + 0.80 | − 7.02 |
| ÷ .293 | ÷ .293 | + 0.4 | − 3.51 |
| + 16.4 | − 195.3 | | |
| √ | / | | |

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1909phae.proj.2302B



# A 7497 No. 126 October 16, 1909.

1900 pos. 21 29 46.0 − 53 52.8

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| a. | −54 9898 | 21 27 42.7 | −54 | 21.5 | +18.4 | = 21 28 0.9 | + 22.3 = −53 59.2 |
| b. | −53 10109 | 21 28 5.4 | −53 | 54.7 | −4.3 | = 21 28 1.1 | − 4.8 = −53 59.5 |
| c. | −53 10107 | 21 27 47.4 | −53 | 14.4 | | 21 28 1.0 | − −53° 59.4 |

x

c − a = + 4.7 — −0.1 +0.1 — −0.2 +0.1

$\frac{c_{00} - 53.2}{2}$

.300

+ 1.4

| | x | y | x | y |
|---|---|---|---|---|
| a | 35.0 | 20.5 | 40.0 | 29.0 |
| b | 41.6 | 74.6 | 46.6 | 82.9 |
| η | 40.4 | 65.0 | 45.3 | 73.6 |

| x | x | y | y |
|---|---|---|---|
| η−a + 5.4 | η−b − 1.2 | η−a + 44.5 | η−b − 9.6 |
| + 5.3 | − 1.3 | + 44.6 | − 9.6 |
| + 5.35 | − 1.25 | + 44.55 | − 9.6 |
| + 5.40 | − 1.26 | + 44.99 | − 9.70 |
| ÷ .293 | ÷ .293 | + 22.495 | − 4.85 |
| + 18.4 | − 4.3 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 127 October 16, 1909.

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 | jms. | 21 | 29 | 45.4 | − 53 | 56.6 | | | | | |
| a | − 54 | 9898 | 21 | 27 | 42.7 | − 54 | 21.5 | + 17.8 | = | 21 | 28 | 0.5 | + 18.6 | = − 54 | 3.1 | | | | |
| b | − 53 | 10109 | 21 | 28 | 5.4 | − 53 | 54.7 | − 5.0 | = | 21 | 28 | 0.5 | − 8.7 | = − 54 | 3.3 | | | | |
| c | − 53 | 10107 | 21 | 27 | 47.4 | − 53 | 14.4 | | | | 21 | 28 | 0.4 | | − 54° | 3.2 | | | |
| | | | | x | | | | | | | | | | | | | | | |
| | | | | c − a = + 4.7 | | | | | | | | − 0.1 | + 0.1 | | − 0.1 | + 0.1 | | | |
| | | | | .300 | | | | | | | | | | | | | | | |
| | | | | + 1.4 | | | | | | | | | | | | | | | |

c₀₀ − 53.2 / 2

| | x | y | x | y |
|---|---|---|---|---|
| a | 35.0 | 20.5 | 40.0 | 29.0 |
| b | 41.6 | 74.6 | 47.5 | 82.9 |
| η | 40.2 | 57.3 | 45.1 | 66.0 |

| x | x | y | y |
|---|---|---|---|
| η − a + 5.2 | η − b − 1.4 | η − a + 46.8 | η − b − 17.3 |
| + 5.1 | − 1.5 | + 37.0 | − 17.2 |
| + 5.15 | − 1.45 | + 36.9 | − 17.25 |
| + 5.20 | − 1.46 | + 37.27 | − 17.42 |
| ÷ .293 | ÷ .293 | + 18.64 | − 8.71 |
| + 17.8 | − 5.0 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 2497 No. 138 October 16, 1909

1900 prec. 21 29 32.6 -54 3.0

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| a = -54 9898 | 21 | 27 | 42.7 | -54 | 21.5 | +4.8 = 21 27 47.5 | +12.1 = -54 | 9.4 |
| b = -53 10109 | 21 | 28 | 5.4 | -53 | 54.7 | -17.9 = 21 27 47.5 | -15.0 = -54 | 9.7 |
| c = -53 10107 | 21 | 27 | 47.4 | -53 | 14.4 | 21 27 47.6 | | -54° 9'.6 |

c - a = + 4.7

-0.1 +0.1 -0.2 +0.1

$\frac{C_{00} - 53.2}{2}$

.300

+ 1.4

| | x | y | x | y |
|---|---|---|---|---|
| a | 35.0 | 20.5 | 40.0 | 29.0 |
| b | 41.6 | 74.6 | 46.6 | 83.2 |
| η | 36.4 | 44.6 | 41.4 | 53.2 |

| | x | x | y | y |
|---|---|---|---|---|
| η - a | + 1.4 | η - b - 5.2 | η - a + 24.1 | η - b - 30.0 |
| | + 1.4 | - 5.2 | + 24.2 | - 30.0 |
| | + 1.4 | - 5.2 | + 24.15 | - 30.0 |
| | + 1.41 | - 5.25 | + 24.39 | - 30.30 |
| | ÷ .293 | ÷ .293 | + 12.195 | - 15.15 |
| | + 4.8 | - 17.9 | | |
| | √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 129 October 18, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm | 21 | 27 | 59.9 | −54 | 1.7 |
| a = −54 9890 | 21 | 25 | 53.3 | −54 | 5.9 | +21.3 | = 21 | 26 | 14.6 − 2.4 | = −54 | 8.3 |
| b = −54 9905 | 21 | 28 | 21.3 | −54 | 18.8 | −128.2 | = 21 | 26 | 13.4 + 10.5 | = −54 | 8.3 |
| c = −53 10107 | 21 | 27 | 47.4 | −53 | 14.4 | | | 21 | 26 13.8 | | −54° 8.3 |

x

c − b = −33.9

$\frac{c_0 - 53.2}{2}$

.300

−10.2

0.0 0.0 0.0 0.0

| | x | y | x | y |
|---|---|---|---|---|
| a | 26.8 | 45.4 | 31.8 | 54.8 |
| b | 70.0 | 19.6 | 75.0 | 28.9 |
| η | 32.9 | 40.6 | 38.0 | 50.0 |

| | x | x | y | y |
|---|---|---|---|---|
| m − a | +6.1 | m − b −37.1 | m − a −4.8 | m − b +21.0 |
| | +6.2 | −37.0 | −4.8 | +21.1 |
| | +6.15 | −37.05 | −4.8 | +21.05 |
| | +6.21 | −37.42 | −4.85 | +21.26 |
| | ÷ .292 | ÷ .292 | −2.42 | +10.63 |
| | +21.3 | −128.2 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 130 October 18, 1909.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 1900 pm. | 21 27 8.3 | −54 0.8 | |
| a = −54 9883 | 21 24 31.6 | −54 26.2 | +52.2 | = | 21 25 23.8 | +19.2 | = −54 7.4 | a |
| b = −53 10098 | 21 26 1.4 | −53 54.1 | −39.4 | = | 21 25 22.4 | −13.4 | = −54 7.4 | b |
| c = −53 10092 | 21 24 37.4 | −53 17.2 | | | 21 25 22.8 | | −54° 7'.4 | c |
| | x | | | | | | | |
| | c − a = +5.8 | | | | +0.5 −0.4 | | 0.0 0.0 | |
| | .299 | | | | | | | |
| | +1.7 | | | | | | | |

$\frac{c_{00} - 53.3}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 25.4 | 25.0 | 34.0 |
| b | 46.5 | 89.6 | 51.5 | 98.3 |
| η | 35.1 | 63.0 | 40.1 | 71.7 |

| x | x | y | y |
|---|---|---|---|
| η − a +15.1 | η − b −11.4 | η − a +37.6 | η − b −26.6 |
| +15.1 | −11.4 | +37.7 | −26.6 |
| +15.1 | −11.4 | +37.65 | −26.6 |
| +15.25 | −11.51 | +38.03 | −26.87 |
| ÷.292 | ÷.292 | +19.02 | −13.44 |
| +52.2 | −39.4 | | |
| √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 131 October 18, 1909.

| | | | | |
|---|---|---|---|---|
| | | | 1900 pos. 21 15 6.6 | −53 54.5 |
| a = −53 10047 | 21 13 11.3 | −53 56.8 + 7.8 | = 21 13 19.8 − 4.0 | = −54 0.8 |
| b = −54 9853 | 21 14 10.6 | −54 14.7 − 51.9 | = 21 13 18.9 + 14.9 | = −54 0.8 |
| c = −53 10066 | 21 17 31.4 | −53 23.8 | 21 13 19.1 | −54° 0.8 |
| | x | | | |
| cos −53.4 / 2 | c − b = + 200.8 | | −0.1 +0.1 | 0.0 0.0 |
| | .298 | | | |
| | + 59.8 | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 22.7 | 47.0 | 27.7 | 50.7 |
| b | 40.0 | 11.3 | 45.0 | 15.0 |
| n | 25.0 | 39.0 | 29.9 | 42.7 |

| x | x | y | y |
|---|---|---|---|
| n−a + 2.3 | n−b − 15.0 | n−a − 8.0 | n−b + 27.7 |
| + 2.2 | − 15.1 | − 8.0 | + 27.7 |
| + 2.25 | − 15.05 | − 8.0 | + 27.7 |
| + 2.27 | − 15.20 | − 8.08 | + 27.98 |
| ÷ .293 | ÷ .293 | − 4.04 | + 13.99 |
| + 7.8 | − 51.9 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 132 October 18, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 21 | 48 | 39.6 | −54 | 9.1 |
| a | −53 | 10189 | 21 | 45 | 47.3 | −53 | 42.7 | +70.8 | 21 | 46 | 56.7 | −33.5 | −54 | 16.2 | a |
| b | −54 | 9973 | 21 | 47 | 32.2 | −54 | 37.8 | −37.4 | 21 | 46 | 55.1 | +21.7 | −54 | 15.8 | b |
| c | −53 | 10175 | 21 | 43 | 11.3 | −53 | 18.7 | | | 21 | 46 | 56.8 | −54° | 16.2 | c |

$\frac{C_{00} - 53.3}{2}$

c − b = −260.9

× .299

−78.0

+0.7 −0.6 0.0 −0.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 65.8 | 119.5 | 68.7 | 126.1 |
| b | 95.0 | 10.5 | 100.0 | 15.9 |
| η | 88.9 | 53.8 | 89.2 | 59.2 |

| x | x | y | y |
|---|---|---|---|
| η − a | + 20.5 | η − b − 10.8 | η − a − 66.8 | η − b + 43.3 |
| | + 20.5 | − 10.8 | − 66.9 | + 43.3 |
| | + 20.5 | − 10.8 | − 66.85 | + 43.3 |
| | + 20.70 | − 10.91 | − 67.52 | + 43.73 |
| | ÷ .292 | ÷ .292 | − 33.76 | + 21.86 |
| | + 70.9 | − 37.4 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



# Ag497 No. 133 October 18, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 21 | 48 89 | 26.5 58.9 | 5.9 54 24.8 |
| a | -53 10189 | 21 45 47.3 | -53 | 42.7 | +7.9 15.5 | = | 21 46 45.X | 2 3 30.8 | = -54 | 13.0 13.5 |
| b | -54 9973 | 21 47 32.2 | -54 | 37.8 | -3 49.8 | = | 21 46 42.X | 9 4.8 25.9 | = -54 | 3.0 17.8 |
| c | -53 10175 | 21 43 11.3 | -53 | 18.7 | | | 21 46 44.X | | -54° | 13.0 |
| | | x | | | | | | | | |
| | | a-b = -260.9 | | | | | +1.2 -1.1 | | 0.0 | 0.0 |
| | | .299 | | | | | | | | |
| | | -78.0 | | | | | | | | |

Cos $\frac{-53.3}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 65.7 (3.7) | 19.8 (30.6) | 68.7 | 126.1 |
| b | 95.0 | 10.5 | 100.0 | 15.9 |
| n | 84.4 (0.6) | 59.6 (60.0) | 85.6 | 65.6 |

| x | x | y | y |
|---|---|---|---|
| n-a +16.9 | n-b -14.4 | n-a -60.6 | n-b +49.5 |
| +16.9 | -14.4 | -60.5 | +49.7 |
| +16.9 | -14.4 | -60.55 | +49.6 |
| +17.07 | -14.54 | -61.15 | +50.10 |
| ÷.292 | ÷.292 | -30.58 | +25.05 |
| +58.5 | -49.8 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



# A 7497 No. 134 October 18, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fno. | 21 | 44 | 23.9 | -54 | 14.2 |
| a | -54 | 9950 | 21 | 39 | 23.6 | -54 | 24.8 | +198.9 | = 21 | 42 | 14.5 + 3.3 = -54 21.5 |
| b | -54 | 9970 | 21 | 45 | 49.1 | -54 | 17.8 | -189.7 | = 21 | 42 | 41.3 - 3.2 = -54 21.0 |
| c | -53 | 10151 | 21 | 39 | 24.7 | -53 | 30.1 | | 21 | 42 | 14.0.9 -54° 21.'2 |

c - a = + 1.1

$\frac{c_{00} - 53.5}{2}$

.297

+0.3

-0.4 +0.4 +0.3 -0.2

| | x | y | x | y |
|---|---|---|---|---|
| a | 10.0 | 30.2 | 15.0 | 37.6 |
| b | 122.4 | 43.0 | 127.3 | 50.3 |
| n | 67.5 | 36.7 | 79.5 | 48.0 |

| | x | x | y | y |
|---|---|---|---|---|
| n-a | +57.5 | n-b -54.9 | n-a +6.5 | n-b -6.5 |
| | +57.5 | -54.8 | +6.5 | -6.3 |
| | +57.5 | -54.85 | +6.5 | -6.4 |
| | +58.08 | -55.40 | +6.56 | -6.46 |
| | ÷ .292 | ÷ .291 | +3.28 | -3.23 |
| | +198.9 | -189.7 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



# A7497 No. 135 October 18, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fus. | 21 | 42 | 11.8 | - 54 | 13.7 |
| a = | -54 | 9959 | 21 | 41 | 4.6 | - 54 | 21.1 | + 24.2 | = 21 | 41 | 28.8 + 0.4 | = -54 | 20.7 |
| b = | -54 | 9968 | 21 | 45 | 25.6 | - 54 | 11.8 | - 24.2 | = 21 | 41 | 24.5 - 8.2 | = -54 | 20.0 |
| c = | -53 | 1015 | 21 | 40 | 58.7 | - 53 | 36.7 | | | 21 | 41 | 26.6 | -54° 20.4 |
| | | | | | | | | | | | 28.3 | | |

c - a = -48.9 / -46.4

+0.3 −0.3 +0.1 −0.1

cos −53.6 / 2

.297 / 14.5 / −7.8

| | x | y | x | y |
|---|---|---|---|---|
| a | 30.0 | 35.6 | 35.0 | 45.9 |
| b | 106.7 | 52.6 | 111.7 | 61.7 |
| n | 37.0 | 36.3 | 42.0 | 45.7 |

error in the identification of c

| x | x | y | y |
|---|---|---|---|
| n-a + 7.0 | n-b − 69.7 | n-a + 0.7 | n-b − 16.3 |
| + 7.0 | − 69.7 | + 0.8 | − 16.0 |
| + 7.0 | − 69.7 | + 0.75 | − 16.15 |
| + 7.07 | − 70.40 | + 0.76 | −16.31 |
| ÷ .292 | ÷ .292 | + 0.38 | − 8.16 |
| + 24.2 | − 241.1 | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 35.0 | 34.5 | 40.0 | 42.0 |
| b | 111.4 | 52.7 | 116.4 | 60.4 |
| n | 42.0 | 36.3 | 47.0 | 42.9 |

| x | x | y | y |
|---|---|---|---|
| n-a + 7.0 | n-b − 69.4 | n-a + 0.8 | n-b − 17.4 |
| + 7.0 | − 69.4 | + 0.9 | − 17.5 |
| + 7.0 | − 69.4 | + 0.85 | −17.45 |
| + 7.07 | − 70.09 | + 0.86 | −17.62 |
| ÷ .292 | ÷ .292 | + 0.43 | − 8.81 |
| + 24.2 | − 240.0 | | |

✓ ✓

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1909phae.proj.2302B



For remarks see pg. 216 this book.

# A7497 No. 136 October 18, 1909

| | | | | | 1900 for | 21 | 42 | 49.4 | -54 | 9.7 |
|---|---|---|---|---|---|---|---|---|---|---|
| a = | -54 | 9944 | 21 37 34.1 | -54 5.2 | +213.4 | = 21 | 41 | 5.4 − 12.2 | = -54 | 17.8 |
| b = | -54 | 9966 | 21 44 29.1 | -54 26.9 | −202.9 | = 21 | 41 | 6.2 + 11.2 | = -54 | 15.8 |
| c = | -54 | 9944 | 21 37 51.6 | -54 46.2 | | | 21 | 41 6.8 | | -54° 16.6 |

$\frac{c_{00} - 54.8}{I}$

$c - a = +17.5$

$\cdot 288$

$+5.0$

$-1.4 \quad +1.4 \qquad +0.6 \quad -0.7$

$-09 \quad +19$

| | x | y | x | y |
|---|---|---|---|---|
| a | 25.0 | 107.2 | 30.0 | 115.6 |
| b | 145.3 | 61.2 | 150.4 | 69.3 |
| m | 86.7 | 83.3 | 91.7 | 91.2 |

| x | x | y | y |
|---|---|---|---|
| m-a + 61.7 | m-b − 58.6 | m-a − 23.9 | m-b + 22.1 |
| + 61.7 | − 58.7 | − 23.9 | + 21.9 |
| + 61.7 | − 58.65 | − 23.9 | + 22.0 |
| + 62.32 | − 59.24 | − 24.14 | + 22.22 |
| ÷ .292 | ÷ .292 | − 12.07 | + 11.11 |
| + 213.4 | − 202.9 | | |
| √ | √ | | |

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1909phae.proj.2302B



A 4497 No. 137 October 19, 1909

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 pos. | 21 | 39 | 57.8 | − 54 | 24.8 | | |
| a = | − 54 | 9929 | 21 | 35 | 11.0 | − 54 | 32.8 | + 184.4 | = 21 | 38 | 15.4 | + 0.9 | = − 54 | 31.9 | |
| b = | − 54 | 9949 | 21 | 39 | 10.6 | − 54 | 31.2 | − 57.8 | = 21 | 38 | 13.8 | − 0.2 | = − 54 | 31.4 | |
| c = | − 53 | 10133 | 21 | 34 | 57.4 | − 53 | 7.0 | | 21 | 38 | 14.4 | | − 54° | 31.6 | |
| | | | | x | | | | | | | | | | | |
| | | | c − a = | − 13.6 | | | | | | | 0.0 | + 0.1 | | + 0.3 | − 0.2 |
| | | | | .300 | | | | | | | | | | | |
| | | | | − 4.1 | | | | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 25.0 | 10.0 | 30.0 | 15.5 |
| b | 94.5 | 17.3 | 99.4 | 17.8 |
| η | 78.0 | 11.9 | 83.0 | 17.2 |
| | x | x | y | y |
| | η − a + 53.0 | η − b − 16.5 | η − a + 1.9 | η − b − 0.4 |
| | + 53.0 | − 16.4 | + 1.7 | − 0.6 |
| | + 53.0 | − 16.45 | + 1.8 | − 0.5 |
| | + 53.53 | − 16.61 | + 1.82 | − 0.5 |
| | ÷ .290 | ÷ 290 | + 0.91 | − 0.2 |
| | + 184.6 | − 57.3 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 138 October 19, 1909

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 prs. | 21 | 39 | 46.4 | −54 9.0 |
| a = | −54 9939 | 21 | 36 | 36.6 | −54 20.6 | +86.7 (5.8) | = 21 | 38 | 3.3 (2.4) | +4.9 = −54 15.7 |
| b = | −54 9948 | 21 | 38 | 46.6 | −54 13.7 | −44.1 (3.7) | = 21 | 38 | 2.5 (9) | −2.1 = −54 15.8 |
| @ = | −53 10148 | 21 | 38 | 43.2 | −53 14.6 | | | 21 | 38 2.8 (6) | −54° 15.8 |
| | | | | | | | | | −0.2 | +0.3 −0.1 0.0 |

@ − a = −53.2

@ − b = −3.4

.300

−1.0

| | x | y | x | y |
|---|---|---|---|---|
| a | 42.2 | 31.2 | 47.2 | 36.5 |
| b | 80.0 | 45.1 | 85.0 | 50.5 |
| n | 67.2 | 40.9 | 72.3 | 46.3 |

| | x | x | y | y |
|---|---|---|---|---|
| n−a | +25.0 m−b | −12.8 m−a | +9.7 m−b | −4.2 |
| | +25.1 | −12.7 | +9.8 | −4.2 |
| | +25.05 | −12.75 | +9.75 | −4.2 |
| | +25.30 | −12.88 | +9.85 | −4.24 |
| | ÷.292 | ÷.292 | +4.92 | −2.12 |
| | +86.7 | −44.1 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



# A 7497 No. 139 October 19.1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 jm. | 21 | 39 | 19.8 | −54 | 13.8 |
| a = | −54 | 9939 | 21 | 36 | 36.6 | −54 | 20.6 | +59.8 | = 21 | 37 | 35.8 | −0.0 | = −54 20.6 |
| b = | −54 | 9953 | 21 | 40 | 1.6 | −54 | 20.4 | −147.4 | = 21 | 37 | 31.7 | −0.3 | = −54 20.7 |
| c = | −53 | 10154 | 21 | 39 | 45.2 | −53 | 7.5 | | 21 | 37 | 35.8 | | −54° 20.6 |

×

c − b = − 164

Cos −53.1 / 2

.300

− 4.9

0.0 − 0.1 | 0.0 + 0.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 30.1 | 30.6 | 35.1 | 36.8 |
| b | 90.0 | 31.0 | 95.0 | 37.5 |
| m | 47.4 | 30.5 | 52.4 | 37.0 |

| x | x | y | y |
|---|---|---|---|
| m−a + 17.4 | m−b − 42.6 | m−a − 0.1 | m−b − 0.5 |
| + 17.3 | − 42.6 | − 0.0 | − 0.6 |
| + 17.3 | − 42.6 | − 0.05 | − 0.55 |
| + 17.47 | − 43.03 | − 0.05 | − 0.55 |
| ÷ .292 | ÷ .292 | − 0.0 | − 0.28 |
| + 59.8 | − 147.4 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 140 October 19, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 pos. | 21 | 28 | 31.7 | − 54 10.8 |
| a | − 54 | 9890 | 21 | 25 | 53.3 | − 54 | 5.9 | + 52.6 | = 21 26 45.8 | − 11.6 = − 54 17.4 |
| b | − 54 | 9902 | 21 | 27 | 59.3 | − 54 | 32.0 | − 74.0 | = 21 26 45.8 | + 14.8 = − 54 17.3 |
| c | − 53 | 10107 | 21 | 27 | 47.4 | − 53 | 14.4 | | 21 26 45.8 | − 54° 17.3 |
| | | | x | | | | | | | |
| | | | c − b = − 11.9 | | | | | | − 0.3 | + 0.3 0.0 − 0.1 |

$\frac{c_{02} - 53.2}{2}$ · 300 − 3.6

| | x | y | x | y |
|---|---|---|---|---|
| a | 33.4 | 77.2 | 38.4 | 82.3 |
| b | 70.0 | 24.7 | 75.0 | 30.0 |
| η | 47.6 | 54.2 | 57.6 | 59.4 |

| | x | x | y | y |
|---|---|---|---|---|
| η − a | + 15.2 | η − b − 21.4 | η − a − 23.0 | η − b + 29.5 |
| | + 15.2 | − 21.4 | − 23.0 | + 29.4 |
| | + 15.2 | − 21.4 | − 22.95 | + 29.45 |
| | + 15.35 | − 21.61 | − 23.18 | + 29.74 |
| | ÷ .292 | ÷ .292 | − 11.59 | + 14.87 |
| | + 52.6 | − 74.0 | | |

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1909phae.proj.2302B



A 7497 No. 141 October 19, 1909.

| | | | | | | | 1900 fm. | 21 | 28 | 25.3 | − 54 | 8.6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a = | − 54 | 9890 | 21 | 25 | 53.3 | − 54 | 5.9 + 40.4 | = 21 | 26 | 39.2 − 9.4 | = − 54 | 15.3 |
| b = | − 54 | 9902 | 21 | 27 | 59.3 | − 54 | 32.0 − 20.8 | = 21 | 26 | 39.8 + 11.0 | = − 54 | 15.2 |
| c = | − 53 | 10107 | 21 | 27 | 47.4 | − 53 | 14.4 | | 21 | 26 | 39.5 | − 54° 15.2 |
| | | | | | | | | | | −0.3 | + 0.3 | + 0.1 0.0 |

5.9
79.5
6.8

x

c − b = − 11.9

$\frac{\cos -53.2}{2}$

.300

− 3.6

| | x | y | x | y |
|---|---|---|---|---|
| a | 33.4 | 77.2 | 38.4 | 82.3 |
| b | 70.0 | 24.7 | 75.0 | 30.0 |
| η | 46.8 | 58.4 | 51.8 | 63.6 |

| x | x | y | y |
|---|---|---|---|
| η − a + 13.4 | η − b − 23.2 | η − a − 18.8 | η − b + 33.7 |
| + 13.4 | − 23.2 | − 18.7 | + 33.6 |
| + 13.4 | − 23.2 | − 18.75 | + 33.65 |
| + 13.53 | − 23.43 | − 18.93 | + 33.99 |
| ÷ .292 | ÷ .292 | − 9.46 | + 16.995 |
| + 46.4 | − 80.3 | | |
| √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 142? October 19, 1909.

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fno. | 21 | 26 | 45.7 | | −54 | 11.0 | | | | |
| a = | −54 | 9883 | 21 | 24 | 31.6 | −54 | 26.2 | +28.3 | = 21 | 24 | 59.8 | +8.7 | = −54 | 17.5 | | | | a |
| b = | −53 | 10101 | 21 | 26 | 21.4 | −53 | 52.4 | −82.4 | = 21 | 24 | 59.8 | −25.5 | = −54 | 17.8 | | | | b |
| c = | −53 | 10092 | 21 | 24 | 37.4 | −53 | 17.2 | | | 21 | 24 | 59.7 | | −54° | 17.6 | | | c |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | −0.1 | +0.1 | | 0.0 | 0.0 | | | | |

c − a = +5.8

.299

+1.7

c − 53.3 / 2

| | x | xy | x | y |
|---|---|---|---|---|
| a | 25.0 | 41.0 | 30.0 | 46.6 |
| b | 57.1 | 108.7 | 62.1 | 114.2 |
| m | 33.2 | 58.2 | 38.2 | 63.7 |

| | x | x | y | y |
|---|---|---|---|---|
| m − a | +8.2 | m − b −23.9 | m − a +17.2 | m − b −50.5 |
| | +8.2 | −23.9 | +17.1 | −50.5 |
| | +8.28 | −24.14 | +17.32 | −50.00 |
| | ÷.293 | ÷.293 | +8.66 | −25.50 |
| | +28.3 | −82.4 | | |
| | √ | √ | | |

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1000phae.proj.22028



A 4497 No. 143 October 19, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 21 | 23 | 54.8 | −54 22.9 |
| a = | −54 9887 | 21 | 20 | 27.6 | −54 6.2 | +10.8 | = 21 | 22 | 8.4 | −23.2 = −54 29.6 |
| b = | −54 9881 | 21 | 23 | 9.1 | −54 44.3 | −62.5 | = 21 | 22 | 7.2 | +1.9 = −54 29.4 |
| c = | −53 10088 | 21 | 23 | 8.9 | −53 13.1 | | | 21 | 22 | 7.8 8.0 −54° 29.4 |
| | | | | | | | | | | |
| | | | | | c − b = −0.2 | | | | +0.6 | −0.6 0.0 0.0 |
| | | | | | .300 | | | | | |
| | | | | | −0.1 | | | | | |

$\frac{c_{00} - 53.2}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 22.7 | 81.2 | 27.6 | 82.7 |
| b | 70.0 | 5.0 | 75.0 | 6.5 |
| n | 52.0 | 34.9 | 57.0 | 36.3 |

| x | x | y | y |
|---|---|---|---|
| n−a +29.3 | n−b −18.0 | n−a −46.3 | n−b +29.9 |
| +29.4 | −18.0 | −46.4 | +29.8 |
| +29.35 | −18.0 | −46.35 | +29.85 |
| +29.64 | −18.18 | −46.81 | +30.15 |
| ÷.291 | ÷.291 | −23.40 | +15.08 |
| +101.8 | −62.5 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 144 October 19. 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fro. | 21 | 16 | 51.6 | -54 11.5 |
| a = | -54 9853 | 21 | 14 | 10.6 | -54 | 14.7 | +5 | 3.1 | = 21 15 3.1 − 3.1 = | -54 17.8 |
| b = | -54 9860 | 21 | 15 | 49.6 | -54 | 19.9 | −4 | 5.0 | = 21 15 5.0 + 2.0 = | -54 17.9 |
| c = | -53 10066 | 21 | 17 | 31.4 | -53 | 23.8 | | | 21 15 4.1 | -54° 17.8 |
| | | | | x | | | | | | |
| | | c − b = | | + 101.8 | | | | | −0.9 +0.9 | 0.0 +0.1 |
| c00 − 53.4 | | | | .298 | | | | | | |
| Σ | | | | + 30.3 | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 16.5 | 61.7 | 21.4 | 71.2 |
| b | 45.0 | 51.4 | 50.0 | 61.0 |
| η | 31.8 | 55.5 | 36.8 | 65.0 |

| | x | x | y | y |
|---|---|---|---|---|
| m-a | + 15.3 | m-b − 13.2 | m-a − 6.2 | m-b + 4.1 |
| | + 15.4 | − 13.2 | − 6.2 | + 4.0 |
| | + 15.35 | − 13.0 | − 6.2 | + 4.05 |
| | + 15.50 | − 13.13 | − 6.26 | + 4.09 |
| | ÷ .292 | ÷ .292 | − 3.13 | + 2.045 |
| | + 53.1 | − 45.0 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 145 October 19. 1909.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 jun. | 21 | 50 | 0.2 | − 54 | 20.5 | |
| a = | −54 9970 | 21 | 45 | 49.1 | −54 | 17.8 | + 148.9 | = | 21 | 48 | 18.0 | − 9.9 | = −54 | 27.8 |
| b = | −54 9984 | 21 | 50 | 7.7 | −54 | 34.9 | + 109.8 | = | 21 | 48 | 7.9 | + 7.8 | = −54 | 27.4 |
| c = | −53 10175 | 21 | 43 | 11.3 | −53 | 18.7 | | | 21 | 48 | 18.2 | | −54° | 27.6 |
| | | | | x | | | | | | | 0.0 − 0.1 | | +0.1 − 0.2 | |

c − a = −157.8

Coo − 53.3 / 2

.299

− 47.2

| | x | y | x | y |
|---|---|---|---|---|
| a | 50.0 | 52.5 | 52.0 | 59.2 |
| b | 125.3 | 17.6 | 127.3 | 34.4 |
| n | 93.3 | 32.7 | 95.4 | 38.4 |

| x | x | y | y |
|---|---|---|---|
| n − a + 43.3 | n − b − 32.0 | n − a − 19.8 | n − b + 15.1 |
| + 43.4 | − 31.9 | − 19.8 | + 15.0 |
| + 43.35 | − 31.95 | − 19.8 | + 15.05 |
| + 43.78 | − 32.27 | − 20.00 | + 15.20 |
| ÷ .291 | ÷ .291 | − 10.0 | + 7.60 |
| + 150.4 | − 110.9 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 146. October 19, 1909

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 1900 fno. | 21 41 14.6 | -54 27.3 | |
| a = -54 9957 | 21 39 29.1 | -54 15.0 | + 2.1 | = | 21 39 27.0 | -19.2 = | -54 34.2 | a |
| b = -54 9952 | 21 39 32.6 | -54 46.3 | - 2.1 | = | 21 39 30.5 | +12.2 = | -54 34.2 | b |
| c = -53 10157 | 21 39 24.7 | -53 30.1 | | | 21 39 30.8 | | -54° 34'.2 | c |
| | x | | | | | | | |
| | c - b = - 7.9 | | | | +0.4 | -0.3 | 0.0 | 0.0 |
| Cos - 53.5 / 2 | .294 | | | | | | | |
| | - 2.3 | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 53.8 | 87.8 | 58.8 | 96.2 |
| b | 55.0 | 25.2 | 60.0 | 36.5 |
| n | 54.4 | 49.4 | 59.4 | 57.7 |

| x | x | y | y |
|---|---|---|---|
| n-a + 0.6 | n-b - 0.6 | n-a - 38.4 | n-b + 24.2 |
| + 0.6 | - 0.6 | - 38.5 | + 24.2 |
| + 0.6 | - 0.6 | - 38.45 | + 24.2 |
| + 0.61 | - 0.61 | - 38.83 | + 24.44 |
| ÷ .290 | ÷ .290 | - 19.42 | + 12.22 |
| + 2.1 | - 2.1 | | |
| √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 147 October 19, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fno. | 21 | 31 | 50.6 | − 54 | 32.1 |
| a | − 54 | 9901 | 21 | 27 | 58.3 | − 54 | 47.3 | +127.6 | = 21 | 30 | 5.8 + 8.4 = − 54 38.2 |
| b | − 54 | 9919 | 21 | 32 | 52.8 | − 54 | 29.9 | − 168.9 | = 21 | 30 | 3.9 − 8.9 = − 54 38.8 |
| c | − 53 | 10109 | 21 | 28 | 5.4 | − 53 | 54.7 | | | 21 | 30 5.1 − 54° 38.5 |
| | | | | x | | | | | | −0.5 | +0.5 +0.2 −0.3 |

c−a = + 7.1

c−0 − 53.9 / 2

.295

+ 2.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 16.5 | 25.0 | 27.0 |
| b | 105.2 | 50.5 | 110.1 | 61.0 |
| m | 56.7 | 33.2 | 61.6 | 43.7 |

| x | x | y | y |
|---|---|---|---|
| m−a + 36.7 | m−b − 48.5 | m−a + 16.7 | m−b − 17.3 |
| + 36.6 | − 48.5 | + 16.7 | − 17.3 |
| + 36.65 | − 48.5 | + 16.7 | − 17.3 |
| + 37.02 | − 48.98 | + 16.87 | − 17.47 |
| ÷ .290 | ÷ .290 | + 8.44 | − 8.74 |
| + 127.6 | − 168.9 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 148 October 19. 1909

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fms. | 21 31 | 12.1 | -54 | 35.5 |
| a = -54 | 9901 | 21 27 58.3 | -54 | 47.3 | +88.4 | = 21 29 25.8 | + 4.9 | = -54 | 42.4 | a = |
| b = -54 | 9919 | 21 32 52.8 | -54 | 29.9 | -208.1 | = 21 29 24.8 | - 12.3 | = -54 | 42.1 | b = |
| c = -53 | 10109 | 21 28 5.4 | -53 | 54.7 | | 21 29 25.3 | | -54° | 42.3 | c = |

$\frac{c_{00} - 53.9}{2}$

c - a = + 7.1

·295

+ 2.1

-0.5 +0.5 +0.2 -0.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 16.5 | 25.0 | 27.0 |
| b | 105.2 | 50.5 | 110.1 | 61.0 |
| m | 45.4 | 26.1 | 50.4 | 36.7 |

| x | x | y | y |
|---|---|---|---|
| m-a + 25.4 | m-b - 59.8 | m-a + 9.6 | m-b - 24.4 |
| + 25.4 | - 59.7 | + 9.7 | - 24.3 |
| + 25.4 | - 59.75 | + 9.65 | - 24.35 |
| + 25.65 | - 60.35 | + 9.75 | - 24.59 |
| ÷ .290 | ÷ .290 | + 4.88 | - 12.295 |
| + 88.4 | - 208.1 | | |
| √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 149 October 19, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 21 | 42 | 47.8 | −54 | 38.1 |
| a = | −54 9954 | 21 | 40 | 8.1 | −54 | 45.2 | +5 | 5.5 | = 21 | 41 | 3.6 +0.1 = −54 45.1 |
| b = | −54 9962 | 21 | 42 | 42.6 | −54 | 46.1 | −9 | 8 | = 21 | 41 | 4 +1.3 = −54 44.8 |
| c = | −53 10151 | 21 | 39 | 24.7 | −53 | 30.1 | | | 21 | 41 | 3.8 −54° 45.0 |

x

c − a = −43.4

−0.2 +0.2 +0.1 −0.2

Cor. −53.5 / 2

.297

−12.9

| | x | y | x | y |
|---|---|---|---|---|
| a | 25.0 | 22.8 | 30.0 | 31.5 |
| b | 69.5 | 30.4 | 74.6 | 29.3 |
| n | 41.0 | 23.0 | 46.1 | 31.8 |

| | x | x | y | y |
|---|---|---|---|---|
| n − a | +16.0 | n − b − 28.5 | n − a +0.2 | n − b +2.6 |
| | +16.1 | −28.5 | +0.3 | +2.5 |
| | +16.05 | −28.5 | +0.25 | +2.55 |
| | +16.21 | −28.78 | +0.25 | +2.57 |
| | ÷ .289 | ÷ .289 | +0.12 | +1.28 |
| | +56.1 | −99.6 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 150 October 20, 1909

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fwo. | 21 | 44 | 13.4 | −54 | 47.8 |
| a = | −55 | 9703 | 21 | 42 | 21.3 | −55 | 12.2 | +7.8 | = 21 | 42 | 29.0 x + 17.3 y | = −54 54.9 |
| b = | −54 | 9962 | 21 | 42 | 42.6 | −54 | 46.1 | −12.5 | = 21 | 42 | 30.2 x − 8.7 y | = −54 54.8 |
| ⊙ = | −53 | 10168 | 21 | 42 | 13.2 | −53 | 55.3 | | | 21 | 42 29.6 | −54° 54.8 |
| | | | | | x | | | | | | | |
| | | | ⊙ − a = | | − 8.1 | | | | | − 0.6 | + 0.6 | + 0.1 − 0.1 |

C⊙⊙ − 53.9 / I−

.295

− 2.4

| | x | y | x | y |
|---|---|---|---|---|
| a | 30.0 | 15.0 | 35.0 | 21.5 |
| b | 35.8 | 66.8 | 40.7 | 73.5 |
| n | 32.2 | 49.6 | 37.2 | 56.3 |
| | x | x | y | y |
| | n − a + 2.2 | n − b − 3.6 | n − a + 34.6 | n − b − 17.2 |
| | + 2.2 | − 3.5 | + 34.8 | − 17.2 |
| | + 2.2 | − 3.55 | + 34.7 | − 17.2 |
| | + 2.22 | − 3.55 | + 35.05 | − 17.37 |
| | ÷ .287 | ÷ .287 | + 17.52 | − 8.68 |
| | + 7.8 | − 12.5 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 151 October 20, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 pm. | 21 | 44 | 7.6 | −55 | 0.9 |
| a = | −55 | 9703 | 21 | 42 | 21.3 | −55 | 12.2 | +1.4 = | 21 | 42 | 22.7 | +4.3 = −55 | 7.9 |
| b = | −54 | 9962 | 21 | 42 | 42.6 | −54 | 46.1 | −18.8 = | 21 | 42 | 23.8 | −21.8 = −55 | 7.8 |
| c = | −53 | 10168 | 21 | 42 | 13.2 | −53 | 55.3 | | 21 | 42 | 23.4 | −55° | 8.0 |
| | | | | | | | | | | | | | 7.8 |

x

c − a = −8.1 −0.7 +0.6 +0.1 0.0

$\frac{c_{00} - 53.9}{2}$

.295

−2.4

| | x | y | x | y |
|---|---|---|---|---|
| a | 30.0 | 15.0 | 35.0 | 21.5 |
| b | 35.8 | 66.8 | 40.7 | 73.5 |
| η | 30.4 | 23.4 | 35.4 | 30.0 |
| | x | x | y | y |
| | η − a +0.4 | η − b −5.4 | η − a +8.4 | η − b −43.4 |
| | +0.4 | −5.3 | +8.5 | −43.5 |
| | +0.4 | −5.35 | +8.45 | −43.45 |
| | +0.40 | −5.40 | +8.53 | −43.88 |
| | ÷ .287 | ÷ .287 | +4.26 | −21.94 |
| | +1.4 | −18.8 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 152 October 20, 1909

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 1900 fro. | 21 34 35.6 | − 55 8.7 | |
| a = | − 55 9647 | 21 30 34.5 | − 55 12.0 | + 136.8 | = | 21 32 49.9 − 3.6 | = − 55 15.6 | a |
| b = | − 55 9669 | 21 35 12.3 | − 55 17.7 | − 144.1 | = | 21 32 48.7 + 2.3 | = − 55 15.4 | b |
| c = | − 54 9929 | 21 35 11.0 | − 54 32.8 | | | 21 32 49.8 | − 55° 15.5 | c |
| | | x | | | | | | |
| | | c − b = − 1.3 | | | | +0.1 −0.2 | +0.1 −0.1 | |
| c₀₀ − 54.5 / 2 | | .290 | | | | | | |
| | | − 0.4 | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.8 | 22.1 | 20.8 | 29.6 |
| b | 95.0 | 10.5 | 100.0 | 17.8 |
| n | 54.4 | 15.0 | 59.3 | 23.5 |

| x | x | y | y |
|---|---|---|---|
| n − a + 38.6 | n − b − 40.6 | n − a − 7.1 | n − b + 4.5 |
| + 38.6 | − 40.7 | − 7.0 | + 4.7 |
| + 38.6 | − 40.65 | − 7.05 | + 4.6 |
| + 38.99 | − 41.06 | − 7.12 | + 4.65 |
| ÷ .285 | ÷ .285 | − 3.56 | + 3.32 |
| + 136.8 | − 144.1 | | |
| √ | √ | | |

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1909phae.proj.2302B



A 7497 No. 153 October 20, 1909.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fno. | 21 | 33 | 0.9 | −52 | 23.5 |
| a = | −52 | 11909 | 21 | 30 | 49.3 | −52 | 32.9 | +28.8 | = 21 | 31 | 18.7 | +2.7 = −52 30.2 |
| b = | −52 | 11912 | 21 | 31 | 40.6 | −52 | 27.7 | −23.3 | = 21 | 31 | 17.3 | −2.4 = −52 30.1 |
| c = | −51 | 11707 | 21 | 31 | 42.2 | −51 | 32.7 | | | 21 | 31 | 17.8 −52° 30′.2 |

x

c − b = +1.6

.311

+0.5

+0.2 −0.2 0.0 −0.1

$\frac{\text{c.v.} - 57.5}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 39.3 | 40.3 | 44.3 | 47.8 |
| b | 55.0 | 50.5 | 60.0 | 58.0 |
| n | 48.0 | 48.7 | 53.0 | 53.2 |

| x | x | y | y |
|---|---|---|---|
| n − a + 8.7 | n − b − 7.0 | n − a + 8.4 | n − b − 4.8 |
| +8.7 | −7.0 | +5.4 | −4.8 |
| +8.7 | −7.0 | +5.4 | −4.8 |
| +8.79 | −7.07 | +5.45 | −4.85 |
| ÷ .304 | ÷ .304 | +2.72 | −2.42 |
| +28.9 | −23.3 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 154 October 20, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 21 32 | 52.4 | -52 | 24.6 |
| a = -52 | 11909 | 21 30 | 49.3 | -52 | 32.9 | +20.3 | = 21 31 | 9.4 + 1.6 | -52 | 31.3 |
| b = -52 | 11912 | 21 31 | 40.6 | -52 | 29.7 | -31.9 | = 21 31 | 9.0 - 3.6 | -52 | 31.3 |
| c = -51 | 11707 | 21 31 | 43.2 | -51 | 32.7 | | 21 31 | 9.2 | -52° | 31.3 |
| | | | | | | | +0.2 | -0.2 | 0.0 | 0.0 |

c − b = +1.6

$\frac{c_{00} - 51.6}{2}$

.311

+0.5

| | x | y | x | y |
|---|---|---|---|---|
| a | 39.3 | 40.3 | 44.3 | 47.8 |
| b | 55.0 | 50.5 | 60.0 | 58.0 |
| m | 45.4 | 43.5 | 50.4 | 50.9 |

| | x | x | y | y |
|---|---|---|---|---|
| m − a | +6.1 | −9.6 | +3.2 | −7.0 |
| m − b | +6.1 | −9.6 | +3.1 | −7.1 |
| | +6.1 | −9.6 | +3.15 | −7.05 |
| | +6.16 | −9.70 | +3.18 | −7.12 |
| | ÷.304 | ÷.304 | +1.59 | −3.56 |
| | +20.3 | −31.9 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 155 October 20, 1909.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 21 26 53.8 | | | | -53 43.2 | |
| a = -53 10081 | 21 | 21 | 31.4 | -53 | 41.5 | +218.8 | 6.6 | = | 21 | 25 | 8.0 12.1 | -8.5 4 | = -53 | 49.9 58.2 |
| b = -53 10101 | 21 | 26 | 21.4 | -53 | 52.4 | -72.9 | 2 | = | 21 | 25 | 9.2 8.5 | +2.9 | = -53 | 49.5 |
| c = -52 11886 | 21 | 21 | 25.3 | -52 | 40.7 | | | | 21 | 25 | 8.6 9.4 | | -53° | 49.8 |
| | | | x | | | | | | | | | | | |
| | | | c - a = -6.1 | | | | | | | | -0.6 | +0.6 | +0.2 | -0.2 |
| c₀ - 52.7 / 2 | | | .303 | | | | | | | | | | | |
| | | | -1.8 | | | | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 42.5 | 25.0 | 50.0 |
| b | 105.2 | 19.9 | 110.2 | 27.5 |
| n | 83.9 | 25.7 | 88.9 | 33.2 |

| | x | x | y | y |
|---|---|---|---|---|
| n-a | +63.9 | n-b -21.3 | n-a -16.8 | n-b +5.8 |
| | +63.9 | -21.3 | -16.8 | +5.7 |
| | +63.9 | -21.3 | -16.8 | +5.75 |
| | +64.54 | -21.51 | -16.97 | +5.81 |
| | ÷.295 | ÷.295 | -8.48 | +2.90 |
| | +218.8 | -72.9 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



A 7497 No. 156 October 20, 1909.

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 1900 Jno. | 21 | 26 | 40.9 | | −53 | 44.6 | | | |
| a | −53 | 10081 | 21 | 21 | 31.4 | −53 | 41.5 | + | 206.1 | = | 21 | 24 | 57.5 | − | 10.0 | = | −53 | 51.5 |
| b | −53 | 10098 | 21 | 26 | 41.4 | −53 | 54.1 | − | 85.6 | = | 21 | 24 | 55.8 | + | 3.0 | = | −53 | 51.1 |
| c | −52 | 11886 | 21 | 21 | 25.3 | −52 | 40.7 | | | | 21 | 24 | 58.4 | | | | −53° | 51.3 |

c − a = − 6.1

−0.3 +0.3 +0.2 −0.1

$\frac{\text{C}\infty - 52.7}{\Sigma}$

.303

− 1.8

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 42.5 | 25.0 | 50.0 |
| b | 99.5 | 16.8 | 104. | 4.4 |
| | 85.2 | 19.9 | 99.5 | 17.5 |
| | | | 180.2 | |
| n | 80.2 | 22.8 | 85.2 | 30.3 |

| | x | x | y | y |
|---|---|---|---|---|
| n−a | +60.2 | n−b −25.0 | n−a −19.7 | n−b +2.8 |
| | +60.2 | −25.0 | −19.7 | +2.8 |
| | +60.80 | −25.25 | −19.90 | +2.88 |
| | ÷.295 | ÷.295 | −9.95 | +1.44 |
| | +206.1 | −85.6 | | |
| | | −66.1 | | |

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1909phae.proj.2302B



α 7497 No. 157 October 20, 1909.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fno. | 21 | 24 | 25.7 | −53 | 33.3 | |
| a = | −53 | 10085 | 21 | 22 | 25.4 | −53 | 41.5 | +15.8 | = 21 | 22 | 40.9 | +1.7 | = −53 | 39.8 |
| b = | −53 | 10102 | 21 | 26 | 22.9 | −53 | 23.0 | −25.8 | = 21 | 22 | 37.0 | −1.0 | = −53 | 39.8 |
| c = | −52 | 11887 | 21 | 22 | 32.3 | −52 | 57.4 | | | 21 | 22 | 39.2 | −53 | 39.8 |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | +0.4 | −0.4 | 0.0 | 0.0 |

c − a = + 6.9

c − 52.9 / 2

302

+ 2.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 25.0 | 37.0 | 30.0 | 49.9 |
| b | 95.7 | 74.0 | 100.7 | 86.9 |
| n | 29.4 | 40.3 | 34.5 | 53.3 |

| x | x | y | y |
|---|---|---|---|
| n − a + 4.4 | n − b − 66.3 | n − a + 3.3 | n − b − 33.7 |
| + 4.5 | − 66.2 | + 3.4 | − 33.6 |
| + 4.5 | − 66.25 | + 3.35 | − 33.65 |
| + 4.54 | − 66.91 | + 3.38 | − 33.99 |
| ÷ .297 | ÷ .297 | + 1.69 | − 16.995 |
| + 15.3 | − 225.3 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A7497 — No. 158 October 20, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fm. | 21 | 37 | 22.2 | −52 | 40.8 |
| a | −52 | 11917 | 21 | 33 | 51.6 | −52 | 45.9 | +107.8 | 21 | 35 | 38.8 | −1.4 | −52 | 47.4 |
| b | −52 | 11933 | 21 | 37 | 36.6 | −52 | 49.1 | −117.9 | 21 | 35 | 38.1 | +1.4 | −52 | 47.7 |
| c | −53 | 10141 | 21 | 37 | 26.2 | −53 | 40.7 | | | 21 | 35 | 39.2 | −52° | 47.6 |
| | | | | | x | | | | | −0.5 | +0.6 | | −0.2 | +0.1 |

$c_{00} - 53.7$ / z

c − b = − 10.4

.296

− 3.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 22.5 | 128.0 | 27.5 | 145.6 |
| b | 90.0 | 121.4 | 95.0 | 140.0 |
| m | 54.8 | 124.1 | 59.7 | 142.8 |

| x | x | y | y |
|---|---|---|---|
| m − a + 32.3 | m − b − 35.2 | m − a − 2.9 | m − b + 2.8 |
| + 32.2 | − 35.3 | − 2.8 | + 2.8 |
| + 32.25 | − 35.25 | − 2.85 | + 2.75 |
| + 32.57 | − 35.60 | − 2.88 | + 2.78 |
| ÷ .302 | ÷ .302 | − 1.44 | + 1.39 |
| + 107.8 | − 117.9 | | |
| / | √ | | |

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1909phae.proj.2302B



See page 98 for Neb. #160.

A 7497 No. 159 October 20, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fno. | 21 | 36 | 53.0 | −53 55.6 |
| a = | −54 9920 | 21 | 33 | 17.8 | −54 | 4.9 | +112.2 | = 21 35 | 8.9 +0.0 | +2.7 | = −54 2.2 |
| b = | −53 10142 | 21 | 37 | 30.4 | −53 | 59.5 | −142.6 | = 21 35 | 9.2 −3.0 | | = −54 2.5 |
| c = | −52 11933 | 21 | 37 | 36.6 | −52 | 49.1 | | 21 35 | 9.0 | | −54° 2'.4 |

c − b = + 6.2 — 0.1 + 0.2 — 0.2 + 0.1

Cos −52.8 / r — .302

+ 1.9

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.8 | 8.4 | 20.9 | 17.6 |
| b | 90.0 | 19.8 | 95.0 | 28.9 |
| m | 48.5 | 13.8 | 53.5 | 22.9 |

| | x | x | y | y |
|---|---|---|---|---|
| m − a | +32.7 | m − b −41.5 | m − a +5.4 | m − b −6.0 |
| | +32.6 | −41.5 | +5.3 | −6.0 |
| | +32.65 | −41.5 | +5.35 | −6.0 |
| | +32.98 | −41.92 | +5.40 | −6.06 |
| | ÷.294 | ÷.294 | +2.70 | −3.03 |
| | +112.2 | −142.6 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



see page 45 this Book for note on this net
also on pg. 164 for re-meas. of this set of stars — entire
new start — results of re-meas. are practically same
as results given below

Results as obtained by 1st meas pg. 45 this book —
see below

A 7497 No. 45 October 20, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fno. | 21 | 3.6 | 1.9 | −51 44.0 |
| | | | | | | | | 17.7 | | |
| a | −51 11706 | 21 31 31.2 | −51 | 50.3 | +168.2 | = | 21 34 | 19.4 | −1.0 | = −51 51.3 |
| | | | | | 309.4 | | | 21.3 | | |
| b | −51 11736 | 21 39 30.7 | −51 | 50.5 | −312.5 | = | 21 34 | 18.2 | +0.9 | = −51 49.6 |
| c | −51 11705 | 21 31 26.2 | −51 | 3.2 | | | 21 34 | 18.8 | | −51° 50.4 |
| | | | | | | | | 19.5 | | |
| | | | | | | | | 18.7 | | 50.8 |
| | | c − a = −5.0 | | | | | −1.8 | +1.8 | | +0.9 −0.8 |
| | | .315 | | | | | −10 | +2.6 | | +05 −12 |
| | | −1.6 | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 13.8 | 25.0 | 21.5 |
| b | 167.0 | 10.1 | 172.1 | 17.8 |
| n | 71.4 | 11.9 | 76.5 | 19.6 |

| | x | x | y | y |
|---|---|---|---|---|
| n − a | +51.4 | n − b −95.6 | n − a −1.9 | n − b +1.8 |
| | +51.5 | −95.6 | −1.9 | +1.8 |
| | +51.45 | −95.6 | −1.9 | +1.8 |
| | +51.96 | −96.56 | −1.92 | +1.82 |
| | ÷ .309 | ÷ .309 | −0.96 | +0.91 |
| | +168.2 | −312.5 | | |

Results as obtained by 1st meas. pg. 45 this bk. 21 34 17.8 −51° 51.3
" " " " above meas. 21 34 18.3 −51 50.4
" " " " re-meas. pg 167 this Bk. 21 34 19.2 −51 50.7
21 34 18.6 −51° 50.8

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1909phae.proj.2302B



see pg. 17 this book for original meas. of theis obj.

A 7497 No. 17 October 27, 1909.

1900 ps. 21 20 4.5 − 50 44.0

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a = | −57 | 11514 | 21 | 17 | 8.1 | −57 | 44.5 | 4.4 | = | 21 | 18 | 25 | −5.7 | = −50 | 50.1 |
| b = | −58 | 11588 | 21 | 20 | 43.5 | −58 | 47.5 | 2.6 | = | 21 | 18 | 19.9 | +11.8 | = −50 | 50.0 |
| c = | −52 | 11974 | 21 | 20 | 40.3 | −52 | 17.2 | | | | | | | | |
| d = | −51 | 11666 | 21 | 18 | 26.9 | −51 | 3.2 | 6.4 | = | 21 | 18 | 20.8 | +12.9 | = −50 | 50.3 |
| e = | −50 | 11548 | 21 | 18 | 31.6 | −50 | 48.1 | 11.5 | = | 21 | 18 | 20.0 | −2.3 | = −50 | 50.4 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 21 | 18 | 20.8 | | −50 | 50.4 |
| | | | | | | | | | | | | 21.0 | | | |
| | | | | | | | | | | +1.7 | −0.9 | +0.1 | −0.7 | −0.3 | +0.3 | 0.0 | 0.0 |
| | | | | | | | | | | +1.5 | −0.9 | −0.1 | −0.6 | | | | |

b − 2.2
c − 4 = x 44.4
3
cos − 52.0
Σ
6
.308
∓ 0.7

| | | x | y | x | y |
|---|---|---|---|---|---|
| | a | 11.7 | 187.7 | 16.6 | 186.3 |
| | b | 80.0 | 154.0 | 85.0 | 152.5 |
| | m | 35.1 | 176.5 | 40.1 | 174.8 |
| −51 11666 | d | 37.0 | 150.8 | 42.0 | 149.4 |
| −50 11548 | e | 38.7 | 180.9 | 43.7 | 179.4 |

| | x | x | x | x |
|---|---|---|---|---|
| | m−a + 23.4 | m−b − 44.9 | m−d − 1.9 | m−e − 3.6 |
| | + 23.5 | − 44.9 | − 1.9 | − 3.6 |
| | + 23.45 | − 44.9 | − 1.9 | − 3.6 |
| | + 23.68 | − 45.35 | − 1.92 | − 3.64 |
| | ÷ .315 | ÷ .315 | ÷ .315 | ÷ .315 |
| | + 75.2 | − 144.0 | − 6.1 | − 11.6 |
| | y | y | y | y |
| | m−a − 11.2 | m−b + 22.5 | m−d + 25.7 | m−e − 4.4 |
| | − 11.5 | + 22.3 | + 25.4 | − 4.6 |
| | − 11.35 | + 22.4 | + 25.55 | − 4.5 |
| | − 11.46 | + 22.62 | + 25.81 | − 4.54 |
| | − 5.73 | + 11.31 | + 12.90 | − 2.24 |

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1909phae.proj.2302B



See page 42 this book for original meas. of the obj. The results obtained by this meas. appear to be more accurate than those on page 42.

A 7497 No. 42 October 27, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fnd. | 21 | 30 | 58.5 | −51 | 41.1 |
| a = | −52 | 11897 | 21 | 26 | 56.5 | −52 | 1.2 | + 17.7 | = 21 | 29 | 16.3 + 13.9 = −51 | 48.3 | a = |
| b = | −51 | 11708 | 21 | 31 | 55.2 | −51 | 32.0 | − 16.1 | = 21 | 29 | 15.1 − 15.8 = −51 | 47.8 | b = |
| c = | −52 | 11898 | 21 | 27 | 40.3 | −52 | 43.0 | | | | | | c = |
| d = | −51 | 11697 | 21 | 28 | 31.2 | −51 | 53.2 | + 45.5 | = 21 | 29 | 16.5 + 5.1 = −51 | 48.8 | d = |
| e = | −51 | 11707 | 21 | 31 | 42.2 | −51 | 32.0 | + 26.4 | = 21 | 29 | 15.1 − 15.1 = −51 | 47.8 | e = |
| | | | | | | | | − 147.0 | | | 16.0 | | |
| | | | | | | | | | 21 | 29 | +5.1 | −51 | 47.8 |
| | | | | | | | | | | | | | 47.7 |

@ − a = + 43.8

$\frac{@ - a = -52.7}{2}$

.303

+ 13.3

+0.3 −0.3 +0.9 −0.9 +0.6 −0.1 +0.4 −0.8 +0.5 −0.2 +0.3 −0.9

| | | x | y | x | y |
|---|---|---|---|---|---|
| | a | 10.0 | 100.5 | 15.0 | 92.0 |
| | b | 102.8 | 157.5 | 107.8 | 148.8 |
| | η | 53.3 | 126.2 | 58.4 | 117.9 |
| −51 11697 | d @ | 39.4 | 116.0 | 44.5 | 107.5 |
| −51 11707 | e α | 98.9 | 156.2 | 104.0 | 147.6 |

| x | x | x | x | y | y | y | y |
|---|---|---|---|---|---|---|---|
| n−a + 43.3 | n−b − 49.5 | n−c + 13.9 | n−d − 45.6 | n−a + 25.7 | n−b − 31.3 | n−e + 10.2 | n−d − 30.0 |
| + 43.4 | − 49.4 | + 13.9 | − 45.6 | + 25.9 | − 31.1 | + 10.2 | − 29.9 |
| + 43.35 | − 49.45 | + 13.9 | − 45.65 | + 25.8 | − 31.2 | + 10.2 | − 29.95 |
| + 45.78 | − 49.94 | + 14.04 | − 46.06 | + 26.06 | − 31.51 | + 10.30 | − 30.25 |
| ÷ .309 | ÷ .309 | ÷ 1.012 | ÷ .310 | + 13.03 | − 15.76 | + 5.15 | − 15.12 |
| + 148.2 | − 161.6 | + 45.3 | − 148.5 | | | | |
| + 141.2 | | | − 148.5 | | | | |

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1909phae.proj.2302B



see pg 164 for note on this net.

A 7497 No. 45 October 27, 1909.

There are three objects which look nebulous. Have meas. middle obj. (:)

1900 fno. 21 36 1.9 − 51 44.0

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a = −51 | 11706 | 21 | 31 | 31.2 | −51 | 50.3 | +167.8 | = | 21 | 34 | 19.9 | −1.0 | = | −51 51.3 |
| b = −51 | 11736 | 21 | 39 | 30.7 | −51 | 50.5 | −312.5 | = | 21 | 34 | 18.2 | +0.9 | = | −51 49.6 |
| c = −51 | 11705 | 21 | 31 | 26.2 | −51 | 3.2 | | | | | | | | |
| d = −51 | 11709 | 21 | 32 | 38.4 | −51 | 58.5 | +102.6 | = | 21 | 34 | 20.0 | +7.2 | = | −51 51.2 |
| e = −51 | 11721 | 21 | 36 | 8.7 | −51 | 32.8 | −111.0 | = | 21 | 34 | 18.7 | −17.8 | = | −51 50.9 |

c − a = −5.0

Cor. −51.0 / 2

·315

−1.6

21 34 19.8 −51° 50.7

19.3 50.8

18.7

−2.0 +2.0 +0.7 −0.6 +0.6 −1.1 +0.7 −0.3

−14 +26 +13 00 +05 −12 +06 −04

| | | x | y | x | y |
|---|---|---|---|---|---|
| | a | 15.0 | 17.1 | 20.0 | 24.4 |
| | b | 161.9 | 13.3 | 167.0 | 20.8 |
| | n | 66.3 | 15.0 | 71.4 | 22.5 |
| −51 11709 | d | 349. | 0.8 | 40.0 | 8.3 |
| −51 11721 | e | 100.3 | 50.3 | 105.3 | 57.7 |

| x | x | x | x | y | y | y | y |
|---|---|---|---|---|---|---|---|
| n−a +51.3 | n−b −95.6 | n−d +31.4 | n−e −34.0 | n−a −2.1 | n−b +1.7 | n−d +14.2 | n−e −35.3 |
| +51.4 | −95.6 | +31.4 | −33.9 | −1.9 | +1.7 | +14.2 | −35.2 |
| +51.35 | −95.6 | +31.4 | −33.95 | −2.0 | +1.7 | +14.2 | −35.25 |
| +51.86 | −96.56 | +31.71 | −34.29 | −2.02 | +1.72 | +14.34 | −35.60 |
| ÷ .309 | ÷ .309 | ÷ .309 | ÷ .309 | −1.01 | +0.86 | +7.17 | −17.80 |
| +167.8 | −312.5 | +102.6 | −111.0 | | | | |
| ✓ | ✓ | ✓ | ✓ | | | | |

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1909phae.proj.2302B



See page 46 this book for meas. of this net.

A 7497 No. 46 October 27, 1909.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | 1900 prs. | 21 36 53.2 | | -51 38.8 |
| a | -51 11708 | 21 31 55.2 | -51 32.0 | +195.5 | = 21 35 8.7 | -14.0 | = -51 46.0 |
| t | -51 11731 | 21 38 18.9 | -51 58.4 | -184.8 | = 21 35 13.0 | +13.8 | = -51 45.2 |
| c | -52 11912 | 21 31 40.6 | -52 27.7 | | 21 35 11.4 | | -51° 45.6 |
| | | | | | -2.7 | +2.6 | +0.4 -0.4 |

$\frac{c-a}{2} = -52.4$

$c - a = -14.6$

$\times .305$

$-4.4$

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 120.2 | 20.0 | 126.0 |
| t | 132.3 | 65.8 | 137.4 | 71.6 |
| n | 75.0 | 92.2 | 80.0 | 98.0 |

| | x | x | y | y |
|---|---|---|---|---|
| n-a | +60.0 | n-b -57.3 | n-a -28.0 | n-b +26.4 |
| | +60.0 | -57.4 | -28.0 | +26.4 |
| | +60.0 | -57.35 | -28.0 | +26.4 |
| | +60.60 | -57.92 | -28.28 | +26.66 |
| | ÷.310 | ÷.310 | -14.14 | +13.33 |
| | +195.5 | -186.8 | | |
| | √ | √ | | |

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1900phae.proj.2302B

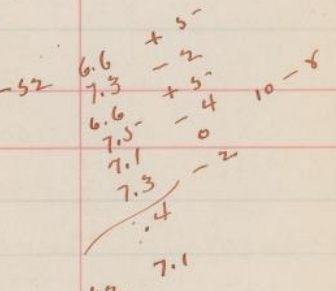


See pg. 52 this book for note on this neb

A 7497 No. 53 October 27, 1909

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1900 fno. | 21 | 37 | 19.8 | − 52 | 0.3 |
| a. | − 52 | 11908 | 21 30 8.3 | − 52 1.3 | + 335.0 | = 21 | 35 | 39.9 | − 5.3 | = − 52 | 6.6 |
| b. | − 52 | 11934 | 21 37 37.1 | − 52 10.1 | − 118.8 | = 21 | 35 | 38.8 | + 2.6 | = − 52 | 7.5 |
| c. | − 52 | 11933 | 21 37 36.6 | − 52 49.1 | | | | | | | |
| d. | − 51 | 11709 | 21 32 38.4 | − 51 58.5 | + 183.4 | = 21 | 35 | 41.8 | − 8.6 | = − 52 | 7.3 |
| e. | − 52 | 11927 | 21 36 20.6 | − 52 18.2 | − 42.4 | = 21 | 35 | 38.4 | + 1.9 | = − 52 | 7.2 |
| | | | | | | | | 39.5 | | | 7.1 |
| | | | c − b = − 0.5 | | | 21 | 35 | 39.6 | | − 52 | 7.0 |
| | | | .302 | | | +0.4 | 0.0 | +0.5 | −0.9 | −0.5 +0.4 | 0.0 +0.2 |
| | | | −0.2 | | | +03 | −01 | +04 | −10 | −04 +05 | +01 +03 |

| | | x | y | x | y |
|---|---|---|---|---|---|
| | a | 12.0 | 100.0 | 17.1 | 113.6 |
| | b | 150.0 | 84.2 | 155.0 | 97.6 |
| | η | 113.9 | 89.4 | 118.9 | 102.9 |
| − 51 11709 | d | 58.2 | 106.7 | 63.1 | 120.2 |
| − 52 11927 | e | 136.8 | 67.7 | 131.8 | 81.0 |




| | x | x | x | x | y | y | y | y |
|---|---|---|---|---|---|---|---|---|
| | η − a + 101.9 | η − b − 36.1 | η − d + 55.7 | η − e − 12.9 | η − a − 10.6 | η − b + 5.2 | η − d − 17.3 | η − e + 21.7 |
| | + 101.8 | − 36.1 | + 55.8 | − 12.9 | − 10.7 | + 5.3 | − 17.3 | + 21.9 |
| | + 101.85 | − 36.1 | + 55.75 | − 12.9 | − 10.65 | + 5.25 | − 17.3 | + 21.8 |
| | + 102.86 | − 36.46 | + 56.31 | − 13.03 | − 10.76 | + 5.30 | − 17.47 | + 22.02 |
| | ÷ .307 | ÷ .307 | ÷ .307 | ÷ .307 | − 5.38 | + 2.65 | − 8.74 | + 11.01 |
| | + 335.0 | − 118.8 | + 183.4 | − 42.4 | | | | |
| | ✓ | ✓ | ✓ | ✓ | | | | |

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1909phae.proj.2302B



see pg 53 this Bk. for note on this neb.

A 7497 No. 54 October 27, 1909. 2nd Dec. 6, 1909.

1900 fm. 21 36 20.2 −51 59.0

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| a = −52 11908 | 21 30 8.3 | −52 1.3 | +272.9 | 21 34 38.5 | −4.1 | = −52 5.4 | a = |
| b = −52 11934 | 21 37 37.1 | −52 10.1 | −180.9 | 21 34 38.0 | +3.9 | = −52 6.2 | b = |
| c = −52 11933 | 21 37 36.6 | −52 49.1 | | | | | c = |
| d = −51 11709 | 21 32 38.4 | −51 58.5 | +121.2 | 21 34 38.4 | −7.5 | = −52 5.9 | d = |
| e = −52 11927 | 21 36 20.6 | −52 18.2 | −104.6 | 21 34 38.7 | +12.1 | = −52 6.1 | e = |
| | | | | 21 34 38.2 | | −52 5.9 | |

c − b = −0.5

Cor. −52.8 / 2

.302

−0.2

+0.5 0.0 +0.4 −1.0 −0.5 +0.3 0.0 +0.2

−04 +04 01 +03

| | x | y | x | y |
|---|---|---|---|---|
| a | 12.0 | 100.0 | 17.1 | 113.6 |
| b | 150.0 | 84.2 | 155.0 | 97.6 |
| η | 95.0 | 91.9 | 100.0 | 105.3 |
| d | | | | |
| −51 11709 ⊕ | 58.2 | 106.7 | 63.1 | 120.2 |
| e | | | | |
| −52 11927 ✗ | 126.8 | 67.7 | 131.8 | 81.0 |

| x | x | x | x | y | y | y 148 | y |
|---|---|---|---|---|---|---|---|
| η−a + 83.0 | η−b − 55.0 | η−d + 36.8 | η−e − 31.8 | η−a − 8.1 | η−b + 7.7 | η−d − 14.5 | η−e + 24.2 |
| + 82.9 | − 55.0 | + 36.9 | − 31.8 | − 8.3 | + 7.7 | − 14.9 | + 24.3 |
| + 82.95 | − 55.0 | + 36.85 | − 31.8 | − 8.2 | + 7.7 | − 14.85 | + 24.25 |
| + 83.78 | − 55.55 | + 37.22 | − 32.12 | − 8.28 | + 7.78 | − 15.00 | + 24.49 |
| ÷ .307 | ÷ .307 | ÷ .307 | ÷ .307 | − 4.14 | + 3.89 | − 7.50 | + 12.24 |
| + 272.9 | − 180.9 | + 121.2 | − 104.6 | | | | |

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1909phae.proj.2302B



see note on pg 54 this Bk.

A 7497 No. 55 October 27, 1909 and Dec. 6, 1909.

1900 pro. 21 34 6.5 − 52 8.6

a = − 52 11908 21 30 8.3 − 52 1.3 + 138.7 = 21 32 25.0 − 12.3 = − 52 13.6

b = − 52 11918 21 34 32.1 − 52 25.9 − 129.7 = 21 32 23.0 + 11.9 = − 52 14.0

c = − 51 11718 21 34 22.7 − 51 40.5

d = − 52 11912 21 31 40.6 − 52 27.7 + 40.0 = 21 32 20.6 + 14.0 = − 52 13.7

e = − 51 11709 21 32 38.4 − 51 58.5 − 13.4 = 21 32 25.0 − 15.3 = − 52 13.8

c − b = − 9.4 21 32 23.4 − 52 13.8

cos − 51.7 .310 23.8

− 2.9

+1.6 −0.4 −2.8 +1.6 −0.2 +0.2 −0.1 0.0

+12 −08 −32 +12

| | x | y | x | y |
|---|---|---|---|---|
| a | 18.7 | 65.6 | 23.6 | 74.3 |
| b | 100.0 | 17.5 | 105.0 | 26.0 |
| n | 60.5 | 41.2 | 65.5 | 49.7 |
| −52 11912 d | 48.3 | 13.3 | 53.2 | 21.8 |
| −51 11709 e | 64.6 | 71.9 | 69.6 | 80.5 |

21 32

25.4 +17
23.2 −5
25.0 +13
23.0 −7
20.6 −31
25.0 +13
24.3 43−43

21 32 23.7

| | x | | x | | x | | x |
|---|---|---|---|---|---|---|---|
| n−a | + 41.8 | n−b | − 39.5 | n−d | + 12.2 | n−e | − 4.1 |
| | + 41.9 | | − 39.5 | | + 12.3 | | − 4.1 |
| | + 41.85 | | − 39.5 | | + 12.25 | | − 4.1 |
| | + 42.27 | | − 39.90 | | + 12.37 | | − 4.14 |
| | ÷ .306 | | ÷ .306 | | ÷ .306 | | ÷ .306 |
| | + 138.1 | | − 130.4 | | + 40.4 | | − 13.5 |

| | y | | y | | y | | y |
|---|---|---|---|---|---|---|---|
| n−a | − 24.4 | n−b | + 23.7 | n−d | + 27.9 | n−e | − 30.7 |
| | − 24.6 | | + 23.7 | | + 27.9 | | − 30.8 |
| | − 24.5 | | + 23.7 | | + 27.9 | | − 30.75 |
| | − 24.74 | | + 23.94 | | + 28.18 | | − 31.06 |
| | − 12.37 | | + 11.97 | | + 14.09 | | − 15.53 |

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1909phae.proj.2302B

A 7497 No. 83 October 27, 1909. and Dec. 6, 1909.

1900 fro. 21 36 20.4 − 52 27.6

a = −52 11914 | 21 32 48.1 | −52 27.8 + 112.0 = 21 34 39.0 − 6.1 = −52 33.9
b = −52 11931 | 21 37 13.6 | −52 44.4 − 157.8 = 21 34 37.4 + 9.6 = −52 34.8
c = −53 10141 | 21 37 26.2 | −53 40.7
d = −52 11918 | 21 34 32.1 | −52 25.9 + 6.2 = 21 34 38.3 − 8.5 = −52 35.4
e = −52 11921 | 21 34 40.6 | −52 40.3 − 4.0 = 21 34 36.6 + 5.8 = −52 34.5

a − b = + 12.6

cos − 53.7

.296

+ 37

21 34 37.8 −52 34.6
37.9 34.4

+1.2 −0.4 +0.5 −1.2 −0.7 +0.2 +0.8 −0.1
+11 −05 +04 −13 −05 +04 +10 +01

| | | x | y | x | y |
|---|---|---|---|---|---|
| | a | 13.8 | 150.2 | 18.8 | 160.6 |
| | b | 95.0 | 118.6 | 100.0 | 129.0 |
| | n | 47.5 | 137.9 | 52.5 | 148.3 |
| −52 11918 | d | 45.6 | 154.9 | 50.6 | 165.2 |
| −52 11921 | e | 48.7 | 126.2 | 53.7 | 136.6 |

−52

33.9 +6
34.7 −2
33.9 +6
34.8 −3
35.4 −9
34.5 0
27.2 12

34.5

−52

x x x x

n−a + 33.7 n−b − 47.5 n−d + 1.9 n−e − 1.2

| + 33.7 | − 47.5 | + 1.9 | − 1.2 |
|---|---|---|---|
| + 33.7 | − 47.5 | + 1.9 | − 1.2 |
| + 34.04 | − 47.98 | + 1.92 | − 1.21 |
| ÷ .304 | ÷ .304 | ÷ .304 | ÷ .304 |
| + 112.0 | − 157.8 | + 6.3 | − 4.0 |

y y y y

n−a − 12.3 n−b + 19.3 n−d − 14.0 n−e + 11.7

| − 12.3 | + 19.3 | − 16.9 | + 11.7 |
|---|---|---|---|
| − 12.3 | + 19.3 | − 16.95 | + 11.7 |
| − 12.42 | + 19.49 | − 17.12 | + 11.82 |
| − 6.21 | + 9.74 | − 8.56 | + 5.91 |

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1909phae_proj_2302B



A 7497 No. 84 October 27, 1909 and Dec. 6, 1909.

1900 fro. 21 36 26.2 −52 28.9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a = | −52 | 11914 | 21 | 32 | 48.1 | −52 | 27.8 | + 11 | 6.1 | = | 21 | 34 | 45.4 | −52 35.3 |
| b = | −52 | 11931 | 21 | 37 | 13.6 | −52 | 44.4 | − 15 | 1.0 | = | 21 | 34 | 42.6 | + 8.3 −52 36.1 |
| c = | −53 | 10141 | 21 | 37 | 26.2 | −51 | 40.7 | | | | | | | |
| d = | −52 | 11918 | 21 | 34 | 32.1 | −52 | 25.9 | + 11 | 6 | = | 21 | 34 | 43.8 | −9.8 = −52 35.8 |
| e = | −52 | 11921 | 21 | 34 | 40.6 | −52 | 40.3 | + 1 | 3 | = | 21 | 34 | 41.9 | + 4.6 = −52 35.7 |
| | | | | | x | | | | | | | | 43.1 | |
| | | | | | e − b = + 12.6 | | | | | | 21 | 34 | 43.8 | −52 35.7 |
| | | | | | | | | | | | | | 43.4 | |

Cos −53.7 / 2 → .296 → + 3.7

+1.1 −0.5 +0.6 −1.2 −0.4 +0.4 0.0 0.0

+08 −08 +03 −15

| | | x | y | x | y |
|---|---|---|---|---|---|
| | a | 13.8 | 150.2 | 18.8 | 160.6 |
| | b | 95.0 | 118.6 | 100.0 | 129.0 |
| | n | 49.1 | 135.3 | 54.1 | 145.6 |
| −52 11918 | d | 45.6 | 154.9 | 50 45.6 | 165.2 |
| −52 11921 | e | 48.7 | 126.2 | 53.7 | 136.6 |

| | x | x | x | x |
|---|---|---|---|---|
| | n − a + 35.3 | n − b − 45.9 | n − d + 3.5 | n − e + 0.4 |
| | + 35.3 | − 45.9 | + 3.5 | + 0.4 |
| | + 35.3 | − 45.9 | + 3.5 | + 0.4 |
| | + 35.65 | − 46.36 | + 3.54 | + 0.40 |
| | ÷ .304 | ÷ .304 | ÷ .304 | ÷ .304 |
| | + 117.3 | − 152.5 | + 11.7 | + 1.3 |
| | y | y | y | y |
| | n − a − 14.9 | n − b + 16.7 | n − d − 19.6 | n − e + 9.1 |
| | − 15.0 | + 16.6 | − 19.6 | + 9.0 |
| | − 14.95 | + 16.65 | − 19.6 | + 9.05 |
| | − 15.10 | + 16.82 | − 19.80 | + 9.14 |
| | − 7.55 | + 8.41 | − 9.90 | + 4.57 |

34 21 43.3

44.5 42.9 44.2 42.6 43.7 41.9 19.8

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void

A 7497 No. 109 October 27, 1909

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a = | −53 | 10158 | 21 | 40 | 38.2 (15.7) | −53 | 34.1 (5.6) | +57.1 | = 21 | 41 | 12.8 | +21.4 | = −53 | 14.2 |
| b = | −52 | 11944 | 21 | 42 | 7.1 | −52 | 59.0 | −39.2 | = 21 | 41 | 27.9 | −16.7 | = −53 | 15.7 |
| c = | −52 | 11940 | 21 | 39 | 36.8 (0.6) | −52 | 40.7 | | | | | | | |
| d = | −53 | 11941 | 21 | 39 | 59.5 | −52 | 59.8 | +88.7 | = 21 | 41 | 28.2 | −14.6 | = −53 | 14.4 |
| e = | −53 | 10170 | 21 | 42 | 24.2 | −53 | 30.5 | −69.0 | = 21 | 41 | 15.2 | +15.1 | = −53 | 15.4 |
| | | | | | | | | | 21 | 41 | 21.0 | | −53 | 14.9 |

c − a = −57.6 (45.1)

c₀₀ − 52.7 / 2

.303
137
− 20.5

| | | x | y | x | y |
|---|---|---|---|---|---|
| | a | 30.0 | 35.5 | 35.0 | 52.0 |
| | b | 58.6 | 110.8 | 63.6 | 127.5 |
| | n | 47.0 | 77.9 | 51.9 | 94.4 |
| −52 11941 | d | 20.6 | 106.8 | 25.6 | 123.3 |
| −53 10170 | e | 67.5 | 47.9 | 72.4 | 64.5 |

| | x | x | x | x |
|---|---|---|---|---|
| n − a | +17.0 | n − b | −11.6 | n − d | +26.4 | n − e | −20.5 |
| | +16.9 | | −11.7 | | +26.3 | | −20.5 |
| | +16.95 | | −11.65 | | +26.35 | | −20.5 |
| | +17.12 | | −11.76 | | +26.61 | | −20.70 |
| | ÷ .300 | | ÷ .300 | | ÷ 300 | | ÷ .300 |
| | +57.1 | | −39.2 | | +88.7 | | −69.0 |

| | y | y | y | y |
|---|---|---|---|---|
| n − a | +42.4 | n − b | −32.9 | n − d | −28.9 | n − e | +30.0 |
| | +42.4 | | −33.1 | | −28.9 | | +29.9 |
| | +42.4 | | −33.0 | | −28.9 | | +29.95 |
| | +42.82 | | −33.33 | | −29.19 | | +30.25 |
| | +21.41 | | −16.66 | | −14.595 | | +15.12 |

Note. Error in orientation for computation of this sub. page III. The theory also seems in error. J.C.

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1909phae.proj.2302B



a 7487 no. x 35 October 27, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 20 | 7 | 13.2 | -44 | 56.6 |
| a = -44 9756 | 20 | 4 | 56.0 | -44 | 58.9 | +32.5 = | 20 | 5 | 38.2 | -1.0 = | -44 59.9 |
| b = -44 9766 | 20 | 6 | 53.3 | -44 | 59.2 | -8 = | 20 | 5 | 27.8 | -0.8 = | -45 0.0 |
| c = -45 9885 | 20 | 1 | 20.6 | -45 | 57.7 | | 20 | 5 | 27.4 | | -45° 0.0 |
| | | | x | | | | | | | | |
| | c-a = -2154 | | | | | | +0.5 | -0.5 | | | -0.1 0.0 |
| C∞ - 45.9 / 2 | .348 | | | | | | | | | | |
| | -75.0 | | | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 85.0 | 169.3 | 86.0 | 161.5 |
| b | 126.8 | 168.8 | 127.8 | 161.0 |
| n | 96.3 | 167.4 | 97.5 | 159.4 |

| | x | x | y | y |
|---|---|---|---|---|
| n-a | +11.3 | n-b -30.5 | n-a ∓1.9 | n-b -1.4 |
| | +11.5 | -30.5 | -2.1 | -1.6 |
| | +11.4 | -30.5 | -2.0 | -1.5 |
| | +11.51 | -30.80 | -2.02 | -1.52 |
| | +.354 | ÷ .354 | -1.01 | -0.76 |
| | +32.5 | -87.0 | | |

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1909phae.proj.2302B



A 7447 No. 2 October 28, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 20 | 6 54.7 | − 44 | 49.6 |
| a | − 44 | 9752 | 20 | 4 10.2 | − 44 | 42.2 | + 59.8 | = 20 5 9.2 | − 44 | 54.0 |
| b | − 45 | 9901 | 20 | 6 10.8 | − 45 | 42 | − 62.4 | = 20 5 9.0 | − 44 | 53.9 |
| c | − 45 | 9885 | 20 | 1 20.6 | − 45 | 57.7 | | 20 5 9.2 | − 44 | 54.0 |
| | | | | x | | | | | | |
| | | | c − a = | − 169.6 | | | | +0.2 −0.2 | | +0.0 −0.1 |
| | | | | .348 | | | | | | |
| | | | | − 59.0 | | | | | | |

Coo − 45.9 / 2

| | x | y | x | y |
|---|---|---|---|---|
| a | 70.0 | 176.4 | 75.0 | 182.0 |
| b | 113.8 | 132.4 | 178 / 166.9 | 138.0 |
| n | 909 | 153.0 | 96.0 | 158.4 |

| | x | x | y | y |
|---|---|---|---|---|
| n-a | + 20.9 | n-b − 21.9 | n-a − 23.4 | n-b + 20.6 |
| | + 21.0 | − 21.8 | − 23.6 | + 20.4 |
| | + 20.95 | − 21.85 | − 23.5 | + 20.5 |
| | + 21.16 | − 22.07 | − 23.74 | + 20.70 |
| | ÷ .354 | ÷ .354 | − 11.87 | + 10.35 |
| | + 59.8 | − 62.4 | | |

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1909phae.proj.2302B



A 7447 No. 3 October 28, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fno. | 20 | 6 | 36.7 | −45 | 6.8 |
| a = −45 9894 | 20 | 3 | 37.6 | −45 | 3.9 | + 7 | = 20 | 4 | 51.2 | − 7.5 | = −45 | 11.3 |
| b = −45 9900 | 20 | 5 | 23.9 | −45 | 13.4 | − 6 | = 20 | 4 | 51.8 | + 2.2 | = −45 | 11.2 |
| c = −46 9908 | 20 | 1 | 2.3 | −46 | 21.5 | | | 20 | 4 | 51.2 | −45° | 11.2 |
| | | x | | | | | | | | | | |
| | | c − a = −155.3 | | | | | | | 0.0 − 0.1 | | +0.1 | 0.0 |

Cos −46.3 / I

.345

−53.6

| | x | y | x | y |
|---|---|---|---|---|
| a | 65.0 | 171.5 | 70.0 | 177.0 |
| b | 102.5 | 152.4 | 107.5 | 157.8 |
| n | 91.0 | 156.7 | 95.9 | 162.1 |

| x | x | y | y |
|---|---|---|---|
| n − a + 26.0 | n − b − 21.5 | n − a − 14.8 | n − b + 4.3 |
| + 25.9 | − 21.6 | − 14.9 | + 4.3 |
| + 25.95 | − 21.55 | − 14.85 | + 4.3 |
| + 26.21 | − 21.67 | − 15.00 | + 4.34 |
| ÷ .353 | ÷ .353 | − 7.50 | + 2.17 |
| + 74.3 | − 61.3 | | |

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1909phae.proj.2302B



For pmeas. ~~this~~ neb. B.S. 10 pg. 158.

A 7447 No. 4 October 28, 1909.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 pos. | 19 | 44 | 19.6 | −45 | 5.7 | |
| a = | −45 | 9795 | 19 | 39 | 28.0 | −45 | 16.8 | +18 49 | = 19 | 42 | 31.8 | +7.5 | = −45 | 9.3 | a = |
| b = | −45 | 9819 | 19 | 45 | 1.1 | −45 | 4.4 | −148.8 | = 19 | 42 | 31.8 | −4.9 | = −45 | 9.3 | b = |
| c = | −46 | 9807 | 19 | 39 | 50.0 | −46 | 18.8 | | 19 | 42 | 32.8 | | −45° | 9.3 | c = |
| | | | | | | | | Mean pos. | 19 | 42 | 32.6 | | −45 | 9.4 | |
| | | | | | | | | | +0.3 | | | | −0.3 | | |
| | | | | | | | | | 0.0 | | | | −0.1 | | |

$\frac{\text{Cov} - 46.3}{2}$

x

c − a = + 22.0

.345

+ 7.6

| | x | y | x | y |
|---|---|---|---|---|
| a | 50 | 147.5 | 10.0 | 152.0 |
| b | 122.5 | 171.9 | 127.5 | 176.6 |
| η | 70.1 | 162.3 | 75.1 | 166.9 |

| x | x | y | y |
|---|---|---|---|
| n − a + 65.1 | n − b − 52.4 | n − a + 14.8 | n − b − 9.6 |
| + 65.1 | − 52.4 | + 14.9 | − 9.7 |
| + 65.1 | − 52.4 | + 14.85 | − 9.65 |
| + 65.75 | − 52.92 | + 15.00 | − 9.75 |
| ÷ .352 | ÷ .352 | + 7.50 | − 488 |
| + 186.8 | − 150.3 | | |
| √ | √ | | |

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1909phae.proj.2302B



A 7447 No. 5 October 28, 1909.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | 1900 fm. | 19 50 56.4 | -45 | 35.5 |
| a = -45 9830 | 19 47 47.6 | -45 56.3 | +82.2 | = | 19 49 9.8 + 17.9 | -45 | 39.5 |
| b = -45 9833 | 19 49 45.1 | -45 31.1 | -35.6 | = | 19 49 9.5 - 8.4 | -45 | 39.5 |
| c = -46 9855 | 19 50 0.3 | -46 25.3 | | | 19 49 9.6 | -45° | 39.4 |
| | x | | | | | | |
| | c-b + 15.2 | | | | -0.4 +0.5 | | +0.1 0.0 |
| Cos -46.4 / 2 | .345 | | | | | | |
| | + 5.2 | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 19.3 | 118.3 | 34.3 | 126.8 |
| b | 60.0 | 168.5 | 65.0 | 177.0 |
| m | 47.7 | 152.0 | 52.7 | 160.3 |

| x | x | y | y |
|---|---|---|---|
| m-a + 28.4 | m-b - 12.3 | m-a + 33.7 | m-b - 16.5 |
| + 28.4 | - 12.3 | + 33.5 | - 16.7 |
| + 28.4 | - 12.3 | + 33.6 | - 16.6 |
| + 28.68 | - 12.42 | + 33.94 | - 16.77 |
| ÷ .349 | ÷ .349 | + 16.97 | - 8.38 |
| + 82.2 | - 35.6 | | |
| √ | √ | | |

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1909phae.proj.2302B



# a 7447 No. 6 October 28, 1908.

1900 fro. 19 55 8.2 − 45 43.5

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| a = −46 9867 | 19 52 37.3 | − 46 13.5 | +43.8 | = 19 53 | 21.0.7 | + 29.5.9 | = − 45 | 47.6 |
| b = −45 9847 | 19 53 45.1 | − 45 32.2 | −23.5 | = 19 53 | 21.8 | − 15.1 | = −45 | 47.4 |
| c = −46 9876 | 19 54 5.8 | − 46 46.3 | | 19 53 | 21.2 | | −45° | 47.'5 |
| | x | | | | −0.5 +0.6 | | +0.1 −0.1 | |
| | c − b = +20.7 | | | | | | | |
| c₀₀ − 46.8 / 2 | .342 | | | | | | | |
| | + 7.1 | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 31.8 | 72.2 | 36.8 | 89.8 |
| b | 55.0 | 154.5 | 60.0 | 172.0 |
| m | 46.9 | 124.1 | 51.9 | 141.8 |

| | x | x | y | y |
|---|---|---|---|---|
| m−a | + 15.1 | m−b − 8.1 | m−a + 51.9 | m−b − 30.4 |
| | + 15.1 | − 8.1 | + 52.0 | − 30.2 |
| | + 15.1 | − 8.1 | + 51.95 | − 30.3 |
| | + 15.25 | − 8.18 | + 52.47 | − 30.60 |
| | ÷ .348 | ÷ .348 | + 26.24 | − 15.30 |
| | + 43.8 | − 23.5 | | |

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1909phae..proj..2302B



# a 4447 No. 7 - October 28, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fm. | 20 | 4 | 27.6 | -45 | 53.3 |
| n = -45 | 9885 | 20 | 1 | 20.6 | -45 | 57.7 | +8 | = | 20 | 2 | 42.2 | -0.0 | = -45 57.7 |
| b = -45 | 9898 | 20 | 4 | 45.2 | -45 | 57.8 | -12 | = | 20 | 2 | 89.5 | +0.3 | = -45 57.5 |
| c = -47 | 9438 | 19 | 59 | 26.0 | -47 | 1.3 | | | 20 | 2 | 89.8 | | -45° 57'.6 |
| | | | | x | | | | | | | | | |
| | | c - a = | | -114.6 | | | | | | | +0.3 -0.3 | | +0.1 -0.1 |
| Cor | -47.0 / 2 | | | .341 | | | | | | | | | |
| | | | | -39.1 | | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 50.0 | 149.5 | 55.0 | 160.0 |
| b | 121.4 | 148.8 | 126.4 | 159.5 |
| n | 78.1 | 149.5 | 83.1 | 160.0 |

| | x | x | y | y |
|---|---|---|---|---|
| n-a | +28.1 | n-b -43.3 | n-a 0.0 | n-b +0.7 |
| | +28.1 | -43.3 | 0.0 | +0.5 |
| | +28.1 | -43.3 | -0.0 | +0.6 |
| | +28.38 | -43.73 | -0.0 | +0.61 |
| | ÷.348 | ÷.348 | 0.0 | +0.3 |
| | +81.6 | -125.7 | | |
| | ✓ | ✓ | | |

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# A 7447 No. 8 October 29, 1909

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fno. | 20 5 | 34.3 | −46 | 3.5 |
| a | −46 9922 | 20 3 | 34.0 | −46 | 11.7 | +13.8 | = 20 3 | 47.6 + 3.9 | = −46 | 7.8 |
| b | −45 9898 | 20 4 | 45.2 | −45 | 57.8 | −57.9 | = 20 3 | 47.9 − 10.2 | = −46 | 7.9 |
| c | −47 9449 | 20 0 | 55.0 | −47 | 2.0 | | | 20 3 47.8 | | −46° 7.8 |
| | | | | | | | | −0.2 +0.1 | | 0.0 +0.1 |

$\frac{\text{cos} - 47.0}{2}$

⊙ − a = −159.0

.341

−54.2

| | x | y | x | y |
|---|---|---|---|---|
| a | 75.0 | 138.5 | 80.0 | 149.0 |
| b | 99.6 | 166.3 | 104.6 | 176.8 |
| η | 79.7 | 146.1 | 84.7 | 156.7 |

| | x | | x | | y | | y | |
|---|---|---|---|---|---|---|---|---|
| η − a | + 4.7 | η − b | − 19.9 | η − a | + 7.6 | η − b | − 20.2 | |
| | + 4.7 | | − 19.9 | | + 7.7 | | − 20.1 | |
| | + 4.7 | | − 19.9 | | + 7.65 | | − 20.15 | |
| | + 4.75 | | − 20.10 | | + 7.73 | | − 20.35 | |
| | ÷ .347 | | ÷ .347 | | + 3.86 | | − 10.18 | |
| | + 13.7 | | − 57.9 | | | | | |

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A 7447 No. 9 October 29, 1909.

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 prs. | 19 | 52 | 23.4 | | −46 | 14.1 | | | | |
| a = | −46 | 9855 | 19 | 50 | 0.3 | −46 | 25.3 | + 35.9 | = | 19 | 50 | 35.8 | | + 7.4 | = | −46 | 18.8 | | |
| b = | −46 | 9863 | 19 | 51 | 59.2 | −46 | 2.3 | − 83.8 | = | 19 | 50 | 35.4 | | − 19.8 | = | −46 | 13.2 | | |
| c = | −46 | 9861 | 19 | 51 | 46.3 | −46 | 54.5 | | | 19 | 50 | 35.4 | | | | −46° | 18.0 | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | 19 | 50 | 35.4 | | | | −46° | 18.0 | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | − 0.7 | | + 0.8 | | | | 0.0 | | 0.0 | |

$\frac{\text{Cos} - 46.9}{\Sigma}$

a − b = − 12.9

.342

− 4.4

| | x | y | x | y |
|---|---|---|---|---|
| a | 24.3 | 115.4 | 29.3 | 128.8 |
| b | 65.0 | 161.5 | 70.0 | 174.9 |
| η | 35.3 | 130.0 | 41.3 | 143.6 |

| x | x | y | y |
|---|---|---|---|
| n-a + 12.0 | n-b − 28.7 | n-a + 14.6 | n-b − 31.5 |
| + 12.0 | − 28.7 | + 14.8 | − 31.3 |
| + 12.0 | − 28.7 | + 14.7 | − 31.4 |
| + 12.12 | − 28.99 | + 14.85 | − 31.71 |
| ÷ .346 | ÷ .346 | + 7.42 | − 15.86 |
| + 35.0 | − 83.8 | | |

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1909phae.proj.2302B



A7447 No. 10 October 29, 1909.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 1900 prs. | 19 46 21.0 | -45 56.1 | |
| a = -46 9831 | 19 43 54.2 | -46 0.6 | +38.7 | = | 19 44 32.5 | +0.9 | = -45 59.7 | a |
| b = -45 9830 | 19 47 47.6 | -46 56.3 | -195.7 | = | 19 44 31.9 | -3.7 | = -46 0.0 | b |
| c = -47 9390 | 19 47 32.3 | -47 19.0 | | | 19 44 31.2 | | -45 59.8 | c |
| | x | | | | | | | |
| | c - b = -15.3 | | | | | -0.7 | +0.7 | -0.1 +0.2 |
| Cos -47.3 / 2 | .339 | | | | | | | |
| | -5.2 | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 19.4 | 162.0 | 24.3 | 170.1 |
| b | 100.0 | 171.0 | 105.0 | 179.3 |
| η | 32.8 | 163.7 | 37.7 | 171.8 |

| | x | x | y | y |
|---|---|---|---|---|
| η-a | +13.4 | η-b -67.3 | η-a +1.7 | η-b -7.5 |
| | +13.4 | -67.3 | +1.7 | -7.5 |
| | +13.4 | -67.25 | +1.7 | -7.4 |
| | +13.43 | -67.92 | +1.72 | -7.47 |
| | ÷.347 | ÷.347 | +0.86 | -3.74 |
| | +38.7 | -195.7 | | |

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1909phae.proj.2302B



A 7447 No. 11 October 29, 1909.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 1900 fm. | 19 46 45.8 | − 46 | 10.3 |
| a = − 46 9837 | 19 44 31.1 | − 46 | 14.5 | + 25.7 | = | 19 44 56.8 | + 0.8 = − 46 | 13.7 |
| b = − 46 9847 | 19 48 1.3 | − 46 | 8.7 | − 183.9 | = | 19 44 57.4 | − 5.5 = − 46 | 14.1 |
| c = − 47 9394 | 19 48 12.3 | − 47 | 6.1 | | | 19 44 57.8 | − 46° | 13.9 |
| | | | | | | | | |
| | c − b = + 11.0 | | | | | − 1.4 + 1.4 | − 0.2 + 0.2 | |
| | .340 | | | | | | | |
| | + 3.7 | | | | | | | |

$\frac{C_{00} - 47.1}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 23.2 | 150.5 | 28.2 | 160.1 |
| b | 95.0 | 163.0 | 100.0 | 177.6 |
| m | 32.0 | 152.1 | 37.0 | 161.7 |

| x | x | y | y |
|---|---|---|---|
| m − a + 8.8 | m − b − 63.0 | m − a + 1.6 | m − b − 10.9 |
| + 8.8 | − 63.0 | + 1.6 | − 10.9 |
| + 8.8 | − 63.0 | + 1.6 | − 10.9 |
| + 8.89 | − 63.63 | + 1.62 | − 11.01 |
| ÷ .346 | ÷ .346 | + 0.81 | − 5.50 |
| + 25.7 | − 183.9 | | |

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1909phae.proj.2302B



A 7447 No. 12 October 29, 1909.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 pos. | 20 | 8 | 50.4 | −46 | 27.3 | |
| a = | −46 | 9934 | 20 | 6 | 31.6 | −46 | 42.4 | +32.2 | = 20 | 7 | 3.8 | +10.8 | = −46 | 31.8 | n |
| b = | −46 | 9938 | 20 | 7 | 45.1 | −46 | 17.2 | −42.1 | = 20 | 7 | 3.2 | −14.7 | = −46 | 31.8 | b |
| c = | −47 | 9455 | 20 | 2 | 38.8 | −47 | 15.4 | | | 20 | 7 | 3.4 | −46° | 31.8 | c |

$\frac{c+a}{2} = -47.2$

$c - a = -24.8$

$\times .340$

$-8.2.6$

+0.1 0.0 0.0 0.0

| | x | y | x | y |
|---|---|---|---|---|
| a | 90.0 | 113.5 | 95.0 | 120.9 |
| b | 115.3 | 163.9 | 120.3 | 171.4 |
| n | 101.0 | 134.9 | 105.9 | 142.3 |

| | x | x | y | y |
|---|---|---|---|---|
| n−a | +11.0 | n−b −14.3 | n−a +21.4 | n−b −29.0 |
| | +10.9 | −14.4 | +21.4 | −29.1 |
| | +10.95 | −14.35 | +21.4 | −29.05 |
| | +11.06 | −14.49 | +21.61 | −29.34 |
| | ÷ 344 | ÷ .344 | +10.80 | −14.67 |
| | +32.2 | −42.1 | | |

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1909phae.proj.2302B



# A 7447 No. 13 October 29, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 Jno. | 20 | 6 | 6.8 | -46 | 27.5 |
| a = | -46 | 9926 | 20 | 3 | 55.0 | -46 | 27.7 | +25.0 (4.8) | = 20 | 4 | 24.0 (19.8) | -4.2 | = -46 31.9 |
| b = | -46 | 9929 | 20 | 4 | 34.1 | -46 | 34.1 | -14.4 (3) | = 20 | 4 | 19.8 (8) | +2.2 | = -46 31.9 |
| c = | -47 | 9455 | 20 | 2 | 28.8 | -47 | 15.4 | | | 20 | 4 19.8 | | -46° 31.9 |

x

@ - a = -86.2

.340

-29.3

cos -47.2 / 2

0.0 0.0 0.0 0.0

| | x | y | x | y |
|---|---|---|---|---|
| a | 50.0 | 148.4 | 55.0 | 159.8 |
| b | 63.4 | 135.5 | 68.4 | 147.2 |
| n | 58.5 | 139.9 | 63.5 | 151.6 |

| x | x | y | y |
|---|---|---|---|
| n-a + 8.5 | n-b - 4.9 | n-a - 8.5 | n-b + 4.4 |
| + 8.5 | - 4.9 | - 8.2 | + 4.4 |
| + 8.5 | - 4.9 | - 8.35 | + 4.4 |
| + 8.58 | - 4.95 | - 8.43 | + 4.44 |
| ÷ .344 | ÷ .344 | - 4.32 | + 2.32 |
| + 25.0 | - 14.4 | | |

✓ ✓

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1909phae.proj.2302B



A 7447 No. 14 October 29, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 pro. | 20 | 4 | 49.8 | -46 | 26.3 |
| a = | -46 | 9913 | 20 | 1 | 40.3 | -46 | 34.0 | +83.1 (2.3, 2.6) = | 20 | 3 | 8.4 + 3.5 = | -46 | 30.5 | a |
| b = | -46 | 9926 | 20 | 3 | 55.0 | -46 | 27.7 | -52.6 (1, 9) = | 20 | 3 | 2.4 - 2.9 = | -46 | 30.6 | b |
| c = | -47 | 9451 | 20 | 1 | 41.3 | -47 | 33.6 | | 20 | 3 | 2.8 (8) | -46° | 30.6 | c |

c − a = + 1.0

Σ a − 47.5 / 2

.338

+ 0.3

−0.2 +0.1 −0.1 0.0

| | x | y | x | y |
|---|---|---|---|---|
| a | 45.0 | 143.4 | 50.0 | 155.0 |
| b | 91.2 | 156.1 | 96.2 | 167.7 |
| m | 73.3 | 150.4 | 78.3 | 161.9 |

| x | | x | | y | | y | |
|---|---|---|---|---|---|---|---|
| m − a | + 28.3 | m − b | − 17.9 | m − a | + 7.0 | m − b | − 5.7 |
| ± | 28.3 | | − 17.9 | | + 6.9 | | − 5.8 |
| | + 28.3 | | − 17.9 | | + 6.95 | | − 5.75 |
| | + 28.58 | | − 18.08 | | + 6.03 (7) | | − 5.81 |
| | ÷ .344 | | ÷ .344 | | + 3.51 | | − 2.90 |
| | + 83.1 | | − 52.6 | | | | |

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1909phae.proj.2302B



A 7447 No. 15 October 29, 1909.

| | | | | |
|---|---|---|---|---|
| | | | 1900 pos. 20 3 50.8 | −46 30.5 |
| a = −46 9905 | 19 59 49.3 | −46 39.7 | +135.2 = 20 2 4.5 +4.9 = | −46 34.8 |
| b = −46 9921 | 20 3 30.3 | −46 32.1 | −87.1 = 20 2 3.7 −2.7 = | −46 34.8 |
| c = −47 9444 | 20 0 4.8 | −47 25.5 | 20 2 3.8 | −46° 34.8 |
| | | | −0.5 +0.5 | 0.0 0.0 |

c − a = +15.5

cos −47.4 / 2 .338

+5.2

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 142.0 | 20.0 | 150.4 |
| b | 90.7 | 157.1 | 95.7 | 165.4 |
| n | 61.0 | 151.8 | 66.1 | 160.0 |

| | x | | x | | y | | y |
|---|---|---|---|---|---|---|---|
| n−a | +46.0 | n−b | −29.7 | n−a | +9.8 | n−b | −5.3 |
| | +46.1 | | −29.6 | | +9.6 | | −5.4 |
| | +46.05 | | −29.65 | | +9.7 | | −5.35 |
| | +46.51 | | −29.95 | | +9.80 | | −5.40 |
| | ÷ .344 | | ÷ .344 | | +4.90 | | −2.70 |
| | +135.2 | | −87.1 | | | | |

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1909phae.proj.2302B



A 7447 No. 16 October 29. 1909

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 jus. | 20 | 2 | 42.4 | − 46 | 23.0 | |
| a = | − 46 | 9906 | 19 | 59 | 50.3 | − 46 | 27.9 | + 65.7 | = 20 | 0 | 55.5 | + 0.6 | = − 46 | 27.3 |
| b = | − 46 | 9915 | 20 | 3 | 54.0 | − 46 | 25.9 | − 180.3 | = 20 | 0 | 53.7 | − 1.3 | = − 46 | 27.2 |
| c = | − 47 | 9446 | 20 | 0 | 22.3 | − 47 | 31.8 | | 20 | 0 | 54.6 | | − 46° | 27.'2 |
| | | | | | x | | | | | | | − 0.3 | + 0.3 | + 0.1 0.0 |
| | | | c − a = | | + 32.0 | | | | | | | | | |
| | | | | | .338 | | | | | | | | | |
| | | | | | + 10.8 | | | | | | | | | |

cos a − 47.5

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 143.2 | 35.0 | 155.1 |
| b | 03.8 147.1 | 147.1 | 108.9 | 158.8 |
| n | 43.2 | 144.4 | 47.3 | 156.3 |

| | x | x | y | y |
|---|---|---|---|---|
| n − a | + 23.2 | n − b − 61.6 | n − a + 1.2 | n − b − 2.7 |
| | + 22.3 | − 61.6 | + 1.2 | − 2.5 |
| | + 22.25 | − 61.6 | + 1.2 | − 2.6 |
| | + 22.47 | − 62.22 | + 1.21 | − 2.63 |
| | ÷ .345 | ÷ .345 | + 0.60 | − 1.32 |
| | + 65.2 | − 180.3 | | |
| | √ | √ | | |

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1909phae.proj.2302B



A 7447 No. 17 October 29, 1909

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 jan. | 20 | 2 | 27.8 | −46 | 19.4 |
| a = −46 9906 | 19 | 59 | 50.3 | −46 | 27.9 | +50.8 | = 20 | 0 | 41.1 | + 4.4 | = −46 | 23.5 |
| b = −46 9908 | 20 | 1 | 2.3 | −46 | 21.5 | −22.0 | = 20 | 0 | 40.8 | − 2.1 | = −46 | 23.6 |
| c = −47 9446 | 20 | 0 | 22.3 | −47 | 31.8 | | 20 | 0 | 40.8 | | −46° | 23.6 |
| | | | | | | | | | | | | |
| | | | | | | c − a = | + 32.0 | | | 0.0 − 0.1 | | − 0.1 0.0 |
| | | | | | | | .338 | | | | | |
| | | | | | | | + 10.8 | | | | | |

$\frac{c_{00} - 47.5}{5}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 143.2 | 25.0 | 155.1 |
| b | 44.8 | 156.3 | 49.9 | 163.0 |
| n | 37.3 | 152.0 | 42.4 | 163.9 |

| x | x | y | y |
|---|---|---|---|
| n − a + 17.3 | n − b − 7.5 | n − a + 8.8 | n − b − 4.3 |
| + 17.4 | − 7.5 | + 8.8 | − 4.1 |
| + 17.35 | − 7.5 | + 8.8 | − 4.2 |
| + 17.52 | − 7.58 | + 8.84 | − 4.24 |
| ÷ .345 | ÷ .345 | + 4.44 | − 2.12 |
| + 50.8 | − 22.0 | | |

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1909phae.proj.2302B



A 7447 No. 18 October 29, 1909

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fun. | 19 | 54 | 47.1 | −46 | 25.9 | | | |
| a = | −46 | 9866 | 19 | 52 | 14.8 | −46 | 52.1 | +44.5 | = 19 | 52 | 59.3 | +32.1 | = −46 | 11.8 | 30.0 | a |
| b = | −46 | 9872 | 19 | 53 | 25.3 | −46 | 14.5 | −26.4 | = 19 | 52 | 58.9 | −15.5 | = −46 | 30.4 | 29.8 | b |
| c = | −46 | 9863 | 19 | 51 | 59.2 | −46 | 2.3 | | | 19 | 52 | 59.1 | | −46° | 29.9 | c |

x

c − a = −15.6

+0.2 −0.2 +0.1 −0.1

$\frac{c_{00} - 46.0}{2}$

.347

−5.4

| | x | y | x | y |
|---|---|---|---|---|
| a | 30.0 | 38.8 | 35.0 | 46.4 |
| b | 54.4 | 113.7 | 59.4 | 121.3 |
| η | 45.3 | 83.0 | 50.3 | 90.5 |

| | x | x | y | y |
|---|---|---|---|---|
| n−a | +15.3 | n−b −9.1 | n−a +44.2 | n−b −30.7 |
| | +15.3 | −9.1 | +44.1 | −30.8 |
| | +15.3 | −9.1 | +44.15 | −30.75 |
| | +15.45 | −9.19 | +44.59 | −31.06 |
| | ÷.344 | ÷.344 | +22.295 | −15.53 |
| | +44.9 | −26.7 | | |

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1909phae.proj.2302B



A 7447 No. 19 October 29, 1909

1900 prec. 19 54 28.6 −46 32.6

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| a = −46 9866 | 19 52 14.8 | −46 52.1 | +26.4 | = 19 52 40.9 | +15.4 | = −46 | 36.3 |
| b = −46 9872 | 19 53 25.3 | −46 14.5 | −45.2 | = 19 52 40.5 | −22.2 | = −46 | 36.5 |
| c = −46 9863 | 19 51 59.2 | −46 2.3 | | 19 52 40.7 | | −46° | 36.6 |
| | n | | | | | | |
| | c − a = −15.6 | | | +0.2 −0.2 | | +0.1 −0.1 | |

$\frac{c-a}{2} = -46.0$

.347

−5.4

| | x | y | x | y |
|---|---|---|---|---|
| a | 30.0 | 38.8 | 35.0 | 46.4 |
| b | 54.4 | 113.7 | 59.4 | 121.3 |
| n | 39.0 | 69.7 | 44.0 | 77.3 |

| x | x | y | y |
|---|---|---|---|
| n − a +9.0 | n − b −15.4 | n − a +30.9 | n − b −44.0 |
| +9.0 | −15.4 | +30.9 | −44.0 |
| +9.0 | −15.4 | +30.9 | −44.0 |
| +9.09 | −15.55 | +31.21 | −44.44 |
| ÷ .344 | ÷ .344 | +15.60 | −22.22 |
| +26.4 | −45.2 | | |

✓ ✓

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1909phae.proj.2302B



A 7447 No. 20 October 30, 1909

Net. Stars.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 19 | 54 | 5.4 | -46 25.2 |
| a = | -46 | 9861 | 19 | 51 | 46.3 | -46 | 54.5 | +3 | = 19 | 52 17.8 + 25.2 = -46 29.3 |
| b = | -46 | 9867 | 19 | 52 | 37.3 | -46 | 13.5 | -19.8 | = 19 | 52 17.5 - 15.5 = -46 29.0 |
| c = | -46 | 9816 | 19 | 53 | 2.8 | -47 | 39.2 | | 19 | 52 17.4 -46° 29.2 |

| | | |
|---|---|---|
| | | -0.4 +0.3 |
| | | +0.1 -0.2 |

c-b = +25.5

33.7

+ 8.6

c00 - 47.6 / 2

| | x | y | x | y |
|---|---|---|---|---|
| a | 32.7 | 94.4 | 37.7 | 96.4 |
| b | 50.0 | 176.0 | 55.0 | 178.0 |
| n | 43.3 | 144.9 | 48.2 | 146.9 |

| x | x | y | y |
|---|---|---|---|
| n-a + 10.6 | n-b - 6.7 | n-a + 50.5 | n-b - 31.1 |
| + 10.5 | - 6.8 | + 50.5 | - 31.1 |
| + 10.55 | - 6.75 | + 50.5 | - 31.1 |
| + 10.65 | - 6.82 | + 51.00 | - 31.41 |
| ÷ .344 | ÷ .344 | + 25.50 | - 15.70 |
| + 31.0 | - 19.8 | | |

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1909phae.proj.2302B



A 7447 No. 21 October 30, 1909.

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 1900 fro. | 19 | 53 | 56.0 | − 46 | 30.2 | | |
| a = | − 46 | 9861 | 19 | 51 | 46.3 | − 46 | 54.5 | + 21.6 | = | 19 | 52 | 7.8 | + 30.4 | = − 46 | 34.7 | | |
| b = | − 46 | 9867 | 19 | 52 | 37.3 | − 46 | 13.5 | − 29.2 | = | 19 | 52 | 8.1 | − 20.8 | = − 46 | 34.5 | | |
| c = | − 47 | 9416 | 19 | 53 | 2.8 | − 47 | 39.2 | | | 19 | 52 | 8.0 | | − 46° | 34'.2 | | |
| | | | | | | | | | | | | −0.3 | +0.4 | | +0.1 | −0.1 | |

c − b = + 25.5

.337

+ 8.6

$\frac{c_{00} - 47.6}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 32.7 | 94.4 | 37.7 | 96.4 |
| b | 50.0 | 176.0 | 55.0 | 178.0 |
| η | 40.1 | 134.7 | 45.0 | 137.8 |

| x | x | y | y |
|---|---|---|---|
| m−a + 7.4 | m−b − 9.9 | m−a + 40.3 | m−b − 41.3 |
| + 7.3 | − 10.0 | + 40.4 | − 41.2 |
| + 7.35 | − 9.95 | + 40.35 | − 41.25 |
| + 7.42 | − 10.05 | + 40.75 | − 41.66 |
| ÷ .344 | ÷ .344 | + 20.38 | − 20.83 |
| + 21.6 | − 29.2 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A 7447 No. 22 October 30, 1909.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fno. | 19 | 52 | 42.6 | − 46 | 31.9 | |
| a = | − 46 | 9856 | 19 | 50 | 33.3 | − 46 | 31.8 | + 20.4 | = 19 | 50 | 53.7 | − 3.9 | = − 46 | 35.7 |
| b = | − 46 | 9868 | 19 | 52 | 51.3 | − 46 | 56.8 | − 114.9 | = 19 | 50 | 54.4 | + 2.0 | = − 46 | 35.9 |
| c = | − 47 | 9405 | 19 | 50 | 40.3 | − 47 | 53.0 | | 19 | 50 | 54.2 | | − 46° | 35.8 |
| | | | | | x | | | | | | | | | |
| | | | c − a = | | + 7.0 | | | | − 0.9 | | + 1.0 | | − 0.1 | + 0.1 |

$\frac{c_{00} - 47.9}{2}$

.335

+ 2.3

| | x | y | x | y |
|---|---|---|---|---|
| a | 25.0 | 169.0 | 30.0 | 176.3 |
| b | 71.7 | 119.7 | 76.7 | 126.9 |
| η | 32.0 | 161.4 | 37.0 | 168.6 |

| | x | x | y | y |
|---|---|---|---|---|
| η − a | + 7.0 | η − b − 39.7 | η − a − 7.6 | η − b + 41.7 |
| | + 7.0 | − 39.7 | − 7.7 | + 41.7 |
| | + 7.0 | − 39.7 | − 7.65 | + 41.7 |
| | + 7.07 | − 40.10 | − 7.73 | + 42.12 |
| | ÷ .343 | ÷ .343 | − 3.86 | + 21.06 |
| | + 20.6 | − 116.9 | | |

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1900phae.proj.2302B



A7447 No. 23 October 30, 1909.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fws. | 19 | 51 | 6.7 | −46 | 22.7 6 |
| a. | −46 9839 | 19 | 45 | 38.0 | −46 | 32.8 | +222.4 | = 19 | 49 | 20.7 | +6.8 = −46 | 28.5 |
| b. | −46 9855 | 19 | 50 | 0.3 | −46 | 25.3 | −41.5 | = 19 | 49 | 18.8 | −1.4 = −46 | 26.7 |
| c. | −47 9379 | 19 | 46 | 2.0 | −47 | 14.2 | | | 19 | 49 | 18.7 | −46° | 26.6 |

| | | | |
|---|---|---|---|
| | | | |
| | c − a = +24.0 | | −0.5 +0.5 | −0.0 +0.1 |
| (c − b − 47.2)/2 | .340 | | |
| | +8.2 | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 10.0 | 150.0 | 15.0 | 161.5 |
| b | 99.9 | 165.2 | 104.9 | 176.6 |
| n | 85.7 | 162.4 | 90.8 | 173.9 |

| | x | x | y | y |
|---|---|---|---|---|
| n − a | +75.7 | n − b − 14.2 | n − a +12.4 | n − b − 2.8 |
| | +75.8 | −14.1 | +12.4 | −2.7 |
| | +75.75 | −14.15 | +12.4 | −2.75 |
| | +76.51 | −14.27 | +12.52 | −2.78 |
| | ÷.344 | ÷.344 | +6.26 | −1.39 |
| | +222.4 | −41.5 | | |

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1909phae.proj.2302B



A 7447 No. 24 October 30, 1909.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 1900 fus. 19 | 59 12.9 | 1.6 - 46 | 44.4 |
| a. | - 46 | 9893 | 19 57 2.8 | - 46 51.1 | + 10.2 | = 19 57 18.0 | + 2.7 = - 46 | 48.4 |
| b. | - 46 | 9896 | 19 57 37.8 | - 46 46.0 | - 23.2 | = 19 57 14.6 | - 2.6 = - 46 | 48.6 |
| c. | - 47 | 9429 | 19 56 49.3 | - 47 43.8 | | 19 57 16.8 | | - 46° 48'.5 |
| | | | | | | 13.8 | | |
| | | | c - a = - 13.5 | | | - 0.9 + 1.0 | | - 0.1 + 0.1 |
| Cor | - 47.7 | | .336 | | | | | |
| | 2 | | - 4.5 | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 35.0 | 138.0 | 40.0 | 141.6 |
| b | 46.3 | 138.6 | 51.3 | 152.0 |
| n | 38.4 | 133.4 | 43.5 | 147.0 |

| x | x | y | y |
|---|---|---|---|
| n-a + 3.4 | n-b - 7.9 | n-a + 5.4 | n-b - 5.2 |
| + 3.5 | - 7.8 | + 5.4 | - 5.0 |
| + 3.45 | - 7.85 | + 5.4 | - 5.1 |
| + 3.48 | - 7.93 | + 5.45 | - 5.15 |
| ÷ .342 | ÷ .342 | + 2.72 | - 2.58 |
| + 10.2 | - 23.2 | | |
| / | / | | |

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1000phae.proj.23028



Asteroid No. 25 October 30, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fr. | 19 | 40 | 57.2 | -46 | 34.1 |
| a = -46 | 9798 | 19 | 38 | 49.5 | -46 | 38.1 | +23.8 | = 19 | 39 | 17.9 | + 0.5 | = -46 | 37.6 |
| b = -46 | 9823 | 19 | 41 | 51.0 | -46 | 40.2 | -16.8 | = 19 | 39 | 8.8 | + 2.7 | = -46 | 37.5 |
| c = -45 | 9803 | 19 | 41 | 14.5 | -45 | 41.2 | | 19 | 39 | 8.4 | | -46° | 37.6 |
| | | | | | | | | | | | - 0.5 | + 0.4 | 0.0 - 0.1 |

$\frac{\cos -45.7}{2}$

c - b = - 36.5

.349

- 12.7

| | x | y | x | y |
|---|---|---|---|---|
| a | 26.0 | 40.8 | 31.0 | 51.3 |
| b | 90.0 | 36.5 | 95.0 | 47.0 |
| n | 34.0 | 41.9 | 39.1 | 53.3 |

| | x | x | y | y |
|---|---|---|---|---|
| n-a | + 8.0 | n-b - 56.0 | n-a + 1.1 | n-b + 5.4 |
| | + 8.1 | - 55.9 | + 1.0 | + 5.3 |
| | + 8.05 | - 55.95 | + 1.05 | + 5.35 |
| | + 8.13 | - 56.51 | + 1.06 | + 5.40 |
| | ÷ .345 | ÷ .345 | + 0.53 | + 2.70 |
| | + 23.6 | - 163.8 | | |
| | ✓ | ✓ | | |

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1909phae.proj.2302B



# A 7447 No. 26 October 30, 1909.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 pm. | 20 | 3 | 51.8 | −46 | 49.6 | | |
| a = −46 | 9913 | 20 | 1 | 40.3 | −46 | 34.0 | + 23.5 | = 20 | 2 | 3.8 − 19.8 | = −46 | 54.9 | | 3.8 |
| b = −47 | 8455 | 20 | 2 | 28.8 | −47 | 15.4 | − 34.5 | = 20 | 2 | 4.8 + 21.6 | = −46 | 56.0 | | |
| c = −47 | 9446 | 20 | 0 | 22.3 | −47 | 31.8 | | | 20 | 2 | 4.0 | −46° | 53.9 | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | −0.6 | +0.5 | −0.1 | +0.1 | |

α

c − a = − 78.0

.338

− 26.4

c₀₀ − 47.5

| | x | y | x | y |
|---|---|---|---|---|
| a | 50.0 | 136.0 | 55.0 | 144.5 |
| b | 66.1 | 53.6 | 71.2 | 62.0 |
| n | 57.9 | 96.3 | 62.9 | 104.8 |

| | x | x | y | y |
|---|---|---|---|---|
| n-a | + 7.9 | n-b − 8.2 | n-a − 39.7 | n-b + 42.7 |
| | + 7.9 | − 8.3 | − 39.7 | + 42.8 |
| | + 7.9 | − 8.3 | − 39.7 | + 42.75 |
| | + 7.98 | − 8.38 | − 40.10 | + 43.18 |
| | ÷ .342 | ÷ .342 | − 20.05 | + 21.59 |
| | + 23.3 | − 24.5 | | |
| | ✓ | ✓ | | |

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1909phae.proj.23028



A 7447 No. 27 October 30, 1909.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 prec. | 20 | 3 | 26.1 | -46 50.4 |
| $t$ | -47 9452 | 20 | 1 41.8 | -47 | 6.0 | -3.4 × | 20 | 1 38.4 | +11.5 = | -46 54.7 |
| $t^a$ | -46 9913 | 20 | 1 40.3 | -46 | 34.0 | -3.4 = | 20 | 1 38.2 | -20.5 = | -46 54.5 |
| $c$ | -47 9446 | 20 | 0 22.3 | -47 | 31.8 | | 20 | 1 38.3 | | -46° 54'.6 |

×

$c - a = -78.0$

$\frac{C_{00} - 47.5}{2}$

.338

-26.4

+0.1 −0.1 +0.1 −0.1

| | $x$ | $y$ | $x$ | $y$ |
|---|---|---|---|---|
| $a$ | 50.0 | 136.0 | 55.0 | 144.5 |
| $b$ | 50.5 | 72.5 | 55.4 | 81.0 |
| $\eta$ | 49.3 | 95.1 | 54.3 | 103.6 |

| $x$ | $x$ | $y$ | $y$ |
|---|---|---|---|
| $m-a$ −0.7 | $m-b$ −1.2 | $m-a$ −40.9 | $m-b$ +22.6 |
| −0.7 | −1.1 | −40.9 | +22.6 |
| −0.7 | −1.15 | −40.9 | +22.6 |
| −0.71 | −1.16 | −41.31 | +23.83 |
| ÷.342 | ÷.343 | −20.66 | +11.42 |
| −2.1 | −3.4 | | |
| ✓ | ✓ | | |

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1909phae.proj.2302B



A7447 No. 38 October 30, 1909.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fm. | 20 | 3 | 26.4 | − 46 | 46.6 | |
| b | | | | | | | | | 4.9 | | 1.1 | |
| a = | − 47 | 9452 | 20 | 1 | 41.8 | − 47 | 6.0 | − 2.8 = | 20 | 1 | 39.0 | + 15.4 = |
| a | | | | | | | | | 7 | | | 7 |
| x = | − 46 | 9913 | 20 | 1 | 40.3 | − 46 | 34.0 | − 1.5 = | 20 | 1 | 38.8 | − 16.7 = |
| c = | − 47 | 9446 | 20 | 0 | 22.3 | − 47 | 31.8 | | 20 | 1 | 38.9 | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | − 46 | 54.8 | |
| | | | | | | | | | | | 7 | |
| | | | | | | | | | | − 46 | 50.7 | |
| | | | | | | | | | | − 46° | 50.9 | |

a =
b =
c =

x

C − a = − 78.0

C∞ − 47.5 / 2

.338

− 26.4

+0.1 −0.1 +0.2 −0.2

| | x | y | x | y |
|---|---|---|---|---|
| a | 50.0 | 136.0 | 55.0 | 144.5 |
| b | 50.5 | 72.5 | 55.4 | 81.0 |
| n | 49.5 | 102.5 | 54.5 | 110.9 |

| | x | | x | | y | | y | |
|---|---|---|---|---|---|---|---|---|
| n-a | − 0.5 | n-b | − 1.0 | n-a | − 33.5 | n-b | + 30.0 | |
| | − 0.5 | | − 0.9 | | − 33.6 | | + 29.9 | |
| | − 0.5 | | − 0.95 | | − 33.55 | | + 29.95 | |
| | − 0.50 | | − 0.96 | | − 33.89 | | + 30.25 | |
| | ÷ .342 | | ÷ .342 | | − 16.94 | | + 15.12 | |
| | − 1.5 | | − 2.8 | | | | | |

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1900phae.proj.23028



# A 7447 No. 29 October 30, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fno. | 20 | 2 | 6.3 | −46 | 38.4 |
| a = −47 9433 | 19 | 58 | 32.3 | −47 | 12.1 | +108.2 | = 20 | 0 | 20.5 | +29.7 | = −46 | 42.7 |
| b = −46 9814 | 20 | 1 | 45.3 | −46 | 17.8 | −87.9 | = 20 | 0 | 17.7 | −25.9 | = −46 | 42.7 |
| c = −46 9898 | 19 | 57 | 50.3 | −46 | 10.4 | | | 20 | 0 | 18.8 | −46 | 42.6 |

c − a = − 42.0

cos −46.2 / 2

.346

− 14.5

+0.6 −0.5 +0.1 0.0

| | x | y | x | y |
|---|---|---|---|---|
| a | 25.0 | 23.5 | 30.0 | 33.0 |
| b | 91.6 | 131.7 | 96.6 | 141.4 |
| η | 61.7 | 82.2 | 66.8 | 91.9 |

| x | x | y | y |
|---|---|---|---|
| η − a + 36.7 | η − b − 29.9 | η − a + 58.7 | η − b − 49.5 |
| + 36.8 | − 29.8 | + 58.9 | − 49.5 |
| + 36.75 | − 29.85 | + 58.8 | − 49.5 |
| + 37.12 | − 30.15 | + 59.39 | − 50.00 |
| ÷ .343 | ÷ .343 | + 29.695 | − 25.00 |
| + 108.2 | − 87.9 | | |

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1909phae.proj.2302B



A 7447 No. 30 October 30, 1909

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1900 fw. | 20 | 1 | 57.5 | −46 | 40.4 | | |
| a = −47 | 9433 | 19 | 58 | 32.3 | −47 | 12.1 | +9 8.3 | = 20 | 0 10.6 | +27.4 | = −46 | 44.7 | a = |
| b = −46 | 9914 | 20 | 1 | 45.3 | −46 | 17.8 | +9 5.9 | = 20 | 0 9.4 | −27.6.7 | = −46 | 44.5 | b = |
| c = −46 | 9898 | 19 | 57 | 50.3 | −46 | 10.4 | | 20 | 0 10.0 | | −46° | 44'.6 | c = |

x

c − a = −42.0

.346

−14.5

Obs −46.2

2

+0.6 −0.6 +0.1 −0.1

| | x | y | x | y |
|---|---|---|---|---|
| a | 25.0 | 33.5 | 30.0 | 33.0 |
| b | 91.6 | 131.7 | 96.6 | 141.4 |
| η | 58.7 | 78.2 | 63.7 | 87.9 |

| x | x | y | y |
|---|---|---|---|
| n−a +33.7 | n−b −32.9 | n−a +54.7 | n−b −53.5 |
| +33.7 | −32.9 | +54.9 | −53.5 |
| +33.7 | −32.9 | +54.8 | −53.5 |
| +34.04 | −33.23 | +55.35 | −54.04 |
| +.343 | +.343 | +27.68 | −27.02 |
| +99.3 | −96.9 | | |
| √ | √ | | |

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1909phae.proj.2302B



# A 7447 No. 31 October 30, 1909.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fm. | 20 | 0 | 25.0 | −46 | 49.8 |
| a = −47 9432 | 19 | 57 | 9.3 | −47 | 9.7 | +88.2 | = 19 | 58 | 39.5 | +15.8 | = −46 | 54.0 |
| b = −46 9905 | 19 | 59 | 49.3 | −46 | 39.7 | −7.2 | = 19 | 58 | 37.1 | −14.3 | = −46 | 53.9 |
| c = −47 9444 | 20 | 0 | 4.8 | −47 | 25.5 | | | 19 | 58 | 37.8 | −46° | 54.0 |
| | | | | | | | | | | | | |
| | | | | c − b = | | +1.55 | | | | −0.5 | +0.6 | 0.0 −0.1 |
| | | | | | | .338 | | | | | | |
| | | | | | | +5.2 | | | | | | |

$\frac{\text{Col} - 47.4}{2}$

| | x | y | x | y |
|---|---|---|---|---|
| a | 25.7 | 61.8 | 30.7 | 75.0 |
| b | 80.0 | 121.5 | 85.0 | 134.9 |
| η | 55.6 | 93.2 | 60.5 | 106.6 |

| x | x | y | y |
|---|---|---|---|
| η − a + 29.9 | η − b − 28.4 | η − a + 31.4 | η − b − 28.3 |
| + 29.8 | − 24.5 | + 31.6 | − 28.3 |
| + 29.85 | − 24.45 | + 31.5 | − 28.3 |
| + 30.15 | − 24.69 | + 31.82 | − 28.58 |
| ÷ .342 | ÷ .342 | + 15.91 | − 14.29 |
| + 88.2 | − 72.2 | | |

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1909phae.proj.2302B



A 7447 No. 32 November 6, 1909

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1900 prec. | 19 59 | 39.0 | -46 | 36.2 |
| a = -46 9885 | 19 55 32.3 | -46 | 55.5 | +13.0 | = | 19 57 41.3 | +15.2 | = -46 | 40.5 |
| b = -46 9906 | 19 59 50.3 | -46 | 27.9 | -11.4 | = | 19 57 50.9 | -12.4 | = -46 | 40.3 |
| c = -47 9427 | 19 56 6.8 | -47 | 42.7 | | | 19 57 51.2 | | -46 | 40.3 |
| | | | | | | -1.1 | +1.1 | +0.1 | -0.2 |

c-a = +34.5

336

+11.6

$\frac{c-a}{2} = -47.7$

| | x | y | x | y |
|---|---|---|---|---|
| a | 15.0 | 113.4 | 20.0 | 102.0 |
| b | 103.7 | 168.3 | 107.8 | 151.8 |
| η | 62.2 | 143.7 | 67.2 | 137.1 |

| | x | x | y | y |
|---|---|---|---|---|
| η-a | +47.2 | η-b -40.5 | η-a +30.3 | η-b -24.6 |
| | +47.2 | -40.6 | +30.1 | -24.7 |
| | +47.2 | -40.55 | +30.2 | -24.65 |
| | +47.67 | -40.95 | +30.50 | -24.90 |
| | ÷.343 | ÷.343 | +15.25 | -12.45 |
| | +139.0 | -119.4 | | |

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1909phae.proj.2302B



A 7447 No. 33. November 6, 1909.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 1900 fno. | 19 59 20.4 | −46 | 50.1 |
| a = −47 9422 | 19 54 50.3 | −47 | 10.9 | +163.6 | = 19 57 | 33.3 +16.5 | − 46 | 54.4 |
| b = 46 9905 | 19 59 49.3 | −46 | 39.7 | −138.1 | = 19 57 | 31.7 −14.5 | −46 | 53.9 |
| c = −45 9849 | 19 54 27.6 | −45 | 56.6 | | 19 57 | 32.6 | −46° | 54.1 |
| | | | | | | −0.1 +0.2 | +0.2 −0.3 | |

× .348

c − a = −22.7

− 7.9

Corr −45.9 / 2

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 25.0 | 25.0 | 33.5 |
| b | 122.1 | 86.5 | 127.2 | 98.0 |
| m | 75.4 | 58.1 | 80.4 | 66.7 |

| x | x | y | y |
|---|---|---|---|
| m−a +55.4 | m−b −46.7 | m−a +33.1 | m−b −28.4 |
| +55.4 | −46.8 | +33.2 | −28.3 |
| +55.4 | −46.75 | +33.15 | −28.35 |
| +55.95 | −47.22 | +33.48 | −28.63 |
| ÷.342 | ÷.342 | +16.74 | −14.32 |
| +163.6 | −138.1 | | |

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1909phae.proj.2302B



A 7447 No. 35 November 6, 1909

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fm. | 19 | 58 | 36.4 | −46 | 53.3 | | |
| a = | −47 | 9452 | 19 | 54 | 50.3 | −47 | 10.9 | +11 | 7.8 | = | 19 | 56 | 8.1 | +13 | 3 = −46 57.6 |
| b = | −46 | 9905 | 19 | 59 | 49.3 | −46 | 39.7 | −18 | 0.9 | = | 19 | 56 | 8.4 | −17 | 5 = −46 57.2 |
| c = | −45 | 9849 | 19 | 54 | 27.6 | −45 | 56.6 | | | | 19 | 56 | 48.2 | | −46° 57.4 |

c − a = − 22.7

−0.1 +0.2 +0.2 −0.2

Cos − 45.9 / I

· 348

− 7.9

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 25.0 | 25.0 | 33.5 |
| b | 122.1 | 86.5 | 127.2 | 98.0 |
| η | 60.3 | 51.4 | 65.3 | 60.0 |

| x | x | y | y |
|---|---|---|---|
| η − a + 40.3 | η − b − 61.8 | η − a + 26.4 | η − b − 35.1 |
| + 40.3 | − 61.9 | + 26.5 | − 35.0 |
| + 40.3 | − 61.85 | + 26.45 | − 35.05 |
| + 40.70 | − 62.47 | + 26.71 | − 35.40 |
| ÷ .342 | ÷ .342 | + 13.36 | − 17.70 |
| + 119.0 | − 182.7 | | |

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1909phae.proj.2302B



A 7447 No. 44 November October 6, 1909

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 19 | 57 | 21.0 | − 47 | 2.1 | |
| a = −47 9422 | 19 | 54 | 50.3 | −47 | 10.9 | +44.6 | = 19 | 55 | 34.7 | +4.5 | = −47 | 6.4 |
| b = −46 9905 | 19 | 59 | 49.3 | −46 | 39.7 | −25.1 | = 19 | 55 | 35.2 | −26.5 | = −47 | 5.9 |
| c = −45 9849 | 19 | 54 | 27.6 | −45 | 56.6 | | 19 | 55 | 35.8 | | −47° | 6.5 |

c − a = − 22.7

.348

− 7.9

| | x | y | x | y |
|---|---|---|---|---|
| a | 20.0 | 25.0 | 25.0 | 33.5 |
| b | 122.1 | 86.5 | 127.2 | 98.0 |
| η | 35.1 | 34.0 | 40.1 | 43.5 |

| x | x | y | y |
|---|---|---|---|
| η − a + 15.1 | η − b − 87.0 | η − a + 9.0 | η − b − 52.5 |
| + 15.1 | − 87.1 | + 9.0 | − 52.5 |
| + 15.1 | − 87.05 | + 9.0 | − 52.5 |
| + 15.25 | − 87.92 | + 9.09 | − 53.02 |
| ÷ .342 | ÷ .342 | + 4.54 | − 26.51 |
| + 44.6 | − 257.1 | | |

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1909phae.proj.2302B



A 7447 No. 34. November 6, 1909

Nebulous star

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 1900 prs. | 19 59 25.1 | -46 53.5 | |
| a = -46 9892 | 19 56 52.3 | -46 58.4 | +44.8 | = | 19 57 37.4 | +0.8 | = -46 57.6 | a = |
| b = -46 9902 | 19 57 45.1 | -46 58.8 | -7.7 | = | 19 57 37.4 | -0.2 | = -46 57.6 | b = |
| c = -47 9429 | 19 56 49.3 | -47 43.8 | | | 19 57 37.2 | | -46° 57.6 | c = |
| | x | | | | | | | |
| Coo -47.8 | c - a = -3.0 | | | | +0.4 -0.4 | | 0.0 0.0 | |
| | .336 | | | | | | | |
| | -1.0 | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 45.0 | 126.3 | 50.0 | 140.8 |
| b | 62.7 | 128.3 | 67.8 | 143.8 |
| m | 60.1 | 127.9 | 65.2 | 142.4 |

| x | x | y | y |
|---|---|---|---|
| m-a +15.1 | m-b -2.6 | m-a +1.6 | m-b -0.4 |
| +15.2 | -2.6 | +1.6 | -0.4 |
| +15.15 | -2.6 | +1.6 | -0.4 |
| +15.30 | -2.63 | +1.62 | -0.4 |
| ÷.342 | ÷.342 | +0.81 | -0.2 |
| +44.8 | -7.7 | | |

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A 7447 No. 36 November 6, 1909.

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fm. | 19 | 54 | 26.1 | −46 | 51.6 | | |
| a = | −46 | 9866 | 19 | 52 | 14.8 | −46 | 52.1 | +2.8 | = 19 | 52 | 37.8 | −3.4 | = −46 | 48.7 | 55.5 |
| b = | −46 | 9868 | 19 | 52 | 51.3 | −46 | 56.8 | −13.8 | = 19 | 52 | 37.5 | +1.2 | = −46 | 55.6 | |
| c = | −47 | 9417 | 19 | 53 | 10.3 | −47 | 49.4 | | | 19 | 52 | 37.6 | | −46° | 55.6 |

x

c − b = + 19.0

.336

+ 6.4

$\frac{\cos -47.8}{2}$

0.0 − 0.1 −0.1 0.0

| | x | y | x | y |
|---|---|---|---|---|
| a | 32.5 | 152.1 | 37.5 | 164.2 |
| b | 45.0 | 142.9 | 50.0 | 154.9 |
| m | 40.3 | 145.3 | 45.3 | 157.4 |

| | x | x | y | y |
|---|---|---|---|---|
| m−a | + 7.8 | m−b − 4.7 | m−a − 6.8 | m−b + 2.4 |
| | + 7.8 | − 4.7 | − 6.8 | + 2.5 |
| | + 7.8 | − 4.7 | − 6.8 | + 2.45 |
| | + 7.88 | − 4.75 | − 6.87 | + 2.47 |
| | ÷ .342 | ÷ .342 | − 3.44 | + 1.24 |
| | + 23.0 | − 13.9 | | |

✓ ✓

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| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 fm. | 19 | 52 | 58.4 | − 46 | 37.6 | | | | |
| a = | −46 | 9856 | 19 | 50 | 33.3 | − 46 | 31.8 | + 36.4 | = 19 | 51 | 12.7 | − 9.6 | = − 46 | 41.4 | | | a |
| b = | −46 | 9861 | 19 | 51 | 46.3 | − 46 | 54.5 | − 35.5 | = 19 | 51 | 10.8 | + 12.8 | = − 46 | 41.7 | | | b |
| c = | −47 | 9405 | 19 | 50 | 40.8 | − 47 | 53.0 | | 19 | 51 | 10.2 | | − 46° | 41.6 | | | c |
| | | | | | x | | | | | | | | | | | | |
| | | | c − a = | | + 7.0 | | | | − 0.5 | | + 0.6 | | − 0.2 | | + 0.1 | | |

$\frac{c_{00} - 47.9}{2}$

.335

+ 2.3

| | x | y | x | y |
|---|---|---|---|---|
| a | 35.0 | 169.5 | 40.0 | 177.0 |
| b | 59.7 | 134.6 | 64.7 | 132.1 |
| η | 47.5 | 150.2 | 52.5 | 157.7 |

| | x | x | y | y |
|---|---|---|---|---|
| η − a | + 12.5 η − b | − 12.2 η − a | ∓ 19.3 η − b | + 25.6 |
| | + 12.5 | − 12.2 | − 19.3 | + 25.6 |
| | + 12.5 | − 12.2 | − 19.3 | + 25.6 |
| | + 12.62 | − 12.32 | − 19.49 | + 25.86 |
| | ÷ .343 | ÷ .343 | − 9.745 | + 12.93 |
| | + 36.8 | − 35.9 | | |
| | / | / | | |

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| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1900 fun. | 19 | 52 | 49.8 | -46 | 37.7 | | | |
| a = | -46 | 9856 | 19 | 50 | 33.3 | -46 | 31.8 | +2 | 7.9 | = 19 | 51 | 1.5 | -9.8 | = -46 | 41.6 |
| b = | -46 | 9861 | 19 | 51 | 46.3 | -46 | 54.5 | -44 | 2 | = 19 | 51 | 2.1 | +12.7 | = -46 | 41.8 |
| c = | -47 | 9405 | 19 | 50 | 40.3 | -47 | 53.0 | | | 19 | 51 | 1.6 | | -46° | 41.7 |

×

c-a = +7.0 | -0.4 | +0.5 | -0.1 | +0.1

$\frac{c-a-47.9}{2}$

.335

+2.3

| | x | y | x | y |
|---|---|---|---|---|
| a | 35.0 | 169.5 | 40.0 | 177.0 |
| b | 59.7 | 124.6 | 64.7 | 132.1 |
| m | 44.6 | 150.0 | 49.5 | 157.4 |

| x | | x | | y | | y | |
|---|---|---|---|---|---|---|---|
| m-a | +9.6 | m-b | -15.1 | m-a | -19.5 | m-b | +25.4 |
| | +9.5 | | -15.2 | | -19.6 | | +25.3 |
| | +9.55 | | -15.15 | | -19.55 | | +25.35 |
| | +9.65 | | -15.30 | | -19.75 | | +25.60 |
| | ÷.343 | | ÷.343 | | -9.88 | | +12.80 |
| | +28.2 | | -44.6 | | | | |

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A 7447 No. 39 November 8, 1909.

Object is very close to edge of plate

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 1900 prs. | 20 | 9 | 42.8 | −46 | 50.4 | | |
| a = | −46 | 9936 | 20 | 7 | 20.6 | −46 | 56.5 | +34.8 | = | 20 | 7 | 54.8 | +1.7 | = −46 | 54.8 | a |
| b = | −46 | 9939 | 20 | 8 | 15.3 | −46 | 55.4 | −19.9 | = | 20 | 7 | 56.3 | +0.6 | = −46 | 54.8 | b |
| c = | −46 | 9916 | 20 | 2 | 4.8 | −46 | 13.3 | | | 20 | 7 | 55.6 | | −46° 54′.8 | | c |
| | | | | | × | | | | | | | | | | | |
| | | | c − a = | | −315.8 | | | | | −1.0 | | +0.9 | | 0.0 | 0.0 | |
| cos −46.2 / 2 | | | | | .346 | | | | | | | | | | | |
| | | | | | −109.3 | | | | | | | | | | | |

| | x | y | x | y |
|---|---|---|---|---|
| a | 135.0 | 9.0 | 140.0 | 20.1 |
| b | 153.0 | 11.2 | 158.1 | 22.2 |
| η | 146.6 | 12.4 | 151.6 | 23.5 |

| x | x | y | y |
|---|---|---|---|
| η−a + 11.6 | η−b − 6.4 | η−a + 3.4 | η−b + 1.2 |
| + 11.6 | − 6.5 | + 3.4 | + 1.3 |
| + 11.6 | − 6.45 | + 3.4 | + 1.25 |
| + 11.72 | − 6.51 | + 3.43 | + 1.26 |
| ÷ .342 | ÷ .342 | + 1.72 | + 0.63 |
| + 34.3 | − 19.0 | | |
| √ | √ | | |

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A 7447 No. 40 November 8, 1909.

Object is very close to edge of plate.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1900 prs. | 20 | 9 | 8.4 | − 46 | 54.2 | |
| a = − 46 | 9935 | 20 | 6 | 57.6 | − 46 | 47.5 | + 28.9 | = | 20 | 7 | 20.4 | − 11.2 | = − 46 | 58.6 |
| b = − 47 | 9472 | 20 | 7 | 57.7 | − 46 | 20.3 | − 36.7 | = | 20 | 7 | 21.8 | + 22.8 | = − 46 | 58.5 |
| c = − 47 | 9459 | 20 | 3 | 7.8 | − 47 | 50.3 | | | 20 | 7 | 20.8 | | − 46° | 58.6 |

c − a = − 229.8

− 0.5 + 0.5 0.0 − 0.1

Cos $\frac{-47.8}{2}$

.336

− 77.2

| | x | y | x | y |
|---|---|---|---|---|
| a | 100.0 | 164.9 | 105.0 | 175.6 |
| b | 120.1 | 99.3 | 125.2 | 109.8 |
| n | 107.7 | 142.8 | 112.8 | 153.3 |

| x | x | y | y |
|---|---|---|---|
| n − a + 7.7 | n − b − 12.4 | n − a − 22.1 | n − b + 43.5 |
| + 7.8 | − 12.4 | − 22.3 | + 43.5 |
| + 7.75 | − 12.4 | − 22.2 | + 43.5 |
| + 7.83 | − 12.52 | − 22.42 | + 43.94 |
| ÷ .341 | ÷ .341 | − 11.21 | + 21.97 |
| + 23.0 | − 36.7 | | |

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1909phae.proj.2302B



For original meas. See this book pg. 140

A 7497 No. 136 October 27, 1909

| | | | | | 1900 fnv. | 21 | 42 | 49.4 | -54 | 9.7 |
|---|---|---|---|---|---|---|---|---|---|---|
| a. | -54 | 9942 | 21 | 37 | 34.1 | -54 | 5.2 | +213.6 | = 21 | 41 | 56.7 − 13.6 | = -54 | 17.1 |
| b. | -54 | 9966 | 21 | 44 | 29.1 | -54 | 26.9 | −203.2 | = 21 | 41 | 3.9 + 11.9 | = -54 | 15.8 |
| c. | -54 | 9944 | 21 | 37 | 51.6 | -54 | 46.2 | | | | | | |
| d. | -54 | 9950 | 21 | 39 | 23.6 | -54 | 34.8 | +103.6 | = 21 | 41 | 6.2 + 8.9 | = -54 | 16.9 |
| e. | -53 | 10171 | 21 | 42 | 30.7 | -53 | 59.5 | −88.0 | = 21 | 41 | 3.6 − 17.2 | = -54 | 16.5 |
| | | | | | | | | | | | 5.9 | | 16.6 |
| | | | | | | | | | 21 | 41 | 6.4 | -54 | |
| | | | | | | | | | | | 5.8 | | |
| | | | | | | | | | | | 5.3 | | |

c-a = +17.5

.788

+5.0

cos −54.8 / 2

−0.2 +2.1 +0.4 −2.2 +0.5 −0.7 +0.3 −0.1

−07 +16 −84 −17

| | x | y | x | y |
|---|---|---|---|---|
| a | 40.0 | 93.6 | 45.0 | 102.0 |
| b | 160.5 | 47.8 | 165.5 | 56.4 |
| n | 102.7 | 69.8 | 106.8 | 78.2 |
| d | 71.8 | 53.9 | 76.8 | 62.5 |
| e | 127.2 | 103.7 | 132.2 | 112.3 |

| | x | x | x | x |
|---|---|---|---|---|
| n-a, | +61.7 | n-b, −58.8 | n-d, +29.9 | n-e −25.5 |
| | +61.8 | −58.7 | +30.0 | −25.4 |
| | +61.75 | −58.75 | +29.95 | −25.45 |
| | +62.37 | −59.34 | +30.25 | −25.70 |
| | ÷.292 | ÷.292 | ÷.292 | ÷.292 |
| | +213.6 | −203.2 | +103.6 | −88.0 |

| | y | y | y | y |
|---|---|---|---|---|
| n-a, | −23.8 | n-b, +22.0 | n-d, +15.9 | n-e, −33.9 |
| | −23.8 | +21.8 | +15.7 | −34.1 |
| | −23.8 | +21.9 | +15.8 | −34.0 |
| | −24.04 | +22.12 | +15.96 | −34.34 |
| | −12.02 | +11.06 | +7.98 | −17.17 |

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| No. of net. | Diff in α | Diff in δ | No. of net | Diff in α | Diff. in Dec. | |
|---|---|---|---|---|---|---|
| a 7497. | | | | | | |
| 1 | − 1.9 | + 0.4 | 29 | − 1.0 | + 0.2 | |
| 2 | − 0.3 | − 0.2 | 30 | + 1.2 | 0.0 | |
| 3 | − 0.4 | − 0.4 | 31 | − 0.7 | + 1.1 | |
| 4 | + 1.9 | − 0.2 | 32 | + 1.0 | − 0.1 | |
| 5 | + 1.8 | − 0.3 | 33 | + 1.0 | − 0.1 | |
| 6 | + 1.5 | + 0.2 | 34 | + 2.6 | − 0.8 | |
| 7 | + 1.1 | − 0.3 | 35 | + 1.3 | − 0.3 | |
| 8 | + 0.8 | − 0.4 | 36 | + 3.7 | − 0.1 | |
| 9 | − 3.0 | 0.0 | 37 | + 1.5 | − 0.2 | |
| 10 | + 2.2 | − 0.4 | 38 | + 3.3 | + 1.0 | |
| 11 | + 0.3 | + 0.1 | 39 | + 2.2 | + 0.3 | |
| 12 | − 0.3 | + 0.2 | 40 | + 2.9 | + 0.1 | |
| 13 | + 1.0 | − 0.3 | 41 | + 2.4 | 0.0 | |
| 14 | + 0.4 | − 0.2 | 42 | + 3.9 | + 0.4 | |
| 15 | + 0.4 | − 0.2 | 43 | + 2.0 | − 0.6 | |
| 16 | − 2.3 | + 0.3 | 44 | − 0.1 | − 0.1 | |
| 17 | + 5.0 | − 0.3 | 45 | + 1.2 | + 1.7 | page 164 |
| 18 | − 2.6 | + 0.1 | 46 | − 1.4 | + 1.0 | page 164. |
| 19 | + 1.8 | − 0.1 | 47 | + 0.3 | + 0.2 | |
| 20 | − 1.1 | − 0.4 | 49 | + 2.2 | − 0.1 | |
| 21 | 0.0 | + 1.1 | 50 | + 1.3 | + 0.1 | |
| 22 | + 3.2 | + 0.6 | 51 | + 2.0 | + 0.2 | |
| 23 | + 3.3 | + 0.6 | 52 | − 0.3 | + 0.2 | |
| 24 | + 3.2 | + 0.6 | 53 | + 5.1 | − 0.5 | |
| 25 | + 3.3 | + 0.6 | 54 | + 5.0 | − 0.7 | |
| 26 | + 1.4 | + 1.0 | 55 | + 4.8 | − 0.4 | |
| 27 | + 0.9 | + 0.4 | 56 | + 1.5 | + 0.5 | |
| 28 | + 3.4 | 0.0 | 57 | − 1.8 | + 0.9 | |

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| No. of Neb. | Diff in $\alpha$ | Diff. in Dec | No. of neb. | Diff in $\alpha$ | Diff in $\delta$ |
|---|---|---|---|---|---|
| 58 | +3.0 | +0.8 | 86 | +2.2 | 0.0 |
| 59 | +3.6 | −1.3 | 87 | +0.7 | +0.3 |
| 60 | +1.4 | −2.5 | 88 | +0.4 | +0.1 |
| 61 | +0.7 | +0.3 | 89 | +2.6 | +1.1 |
| 62 | −0.3 | +0.2 | 90 | +3.6 | +0.3 |
| 63 | 0.0 | −0.6 | 91 | +3.6 | +0.3 |
| 64 | +0.1 | −0.6 | 92 | +1.1 | +0.8 |
| 65 | +0.5 | 0.0 | 93 | −1.2 | +0.9 |
| 66 | +1.0 | −0.3 | 94 | +3.1 | +0.2 |
| 67 | −1.6 | −0.5 | 95 | −0.2 | +0.3 |
| 68 | +3.0 | +0.1 | 96 | +2.1 | −0.3 |
| 69 | +1.7 | −0.1 | 97 | −1.1 | +0.3 |
| 70 | +1.6 | −0.2 | 160 | −1.0 | +0.3 |
| 71 | −0.2 | −0.5 | 98 | +2.5 | −0.1 |
| 72 | +0.6 | +0.3 | 99 | +2.4 | −1.0 |
| 73 | −1.0 | +1.4 | 100 | +1.7 | −0.2 |
| 74 | +3.1 | +0.2 | 101 | +3.5 | −0.5 |
| 75 | +3.0 | +0.2 | 102 | 0.0 | −0.1 |
| 76 | +3.0 | +0.2 | 103 | +1.8 | +0.2 |
| 77 | +1.1 | +0.3 | 104 | +1.5 | +0.3 |
| 78 | +1.1 | +0.2 | 12a | −0.3 | +0.2 |
| 79 | +1.2 | −0.3 | 105 | −0.3 | −0.2 |
| 80 | 0.0 | −1.0 | 106 | −1.4 | +0.4 |
| 81 | −0.8 | −0.3 | 107 | −1.1 | 0.0 |
| 82 | +0.5 | 0.0 | 108 | +1.6 | 0.0 |
| 83 | +4.3 | −0.6 | 109 | +0.9 | −0.6 |
| 84 | +4.3 | −0.6 | 112 | +1.7 | −0.4 |
| 85 | +3.4 | +0.2 | 113 | 0.0 | +0.1 |

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| No. of neb. | Diff. in α | Diff. in δ | No. of neb. | Diff. in α | Diff. in δ |
|---|---|---|---|---|---|
| 114 | +1.1 | +0.1 | 140 | +0.6 | +0.4 |
| 115 | +2.1 | +0.2 | 141 | +0.7 | +0.4 |
| 116 | +2.2 | +0.2 | 142 | +0.9 | −0.2 |
| 117 | +1.6 | +0.7 | 143 | +2.8 | +0.4 |
| 118 | +2.0 | +0.4 | 144 | −0.9 | −0.1 |
| 119 | +0.1 | +0.2 | 145 | +2.7 | +0.5 |
| 120 | +1.4 | +0.1 | 146 | +0.7 | +0.3 |
| 121 | +0.6 | −0.2 | 147 | +2.0 | +0.3 |
| 122 | −1.1 | +0.3 | 148 | +2.0 | +0.2 |
| 123 | +0.7 | −0.2 | 149 | +1.2 | +0.3 |
| 110 | +0.2 | −0.3 | 150 | −1.0 | −0.1 |
| 111 | +0.3 | −0.3 | 151 | −1.0 | −0.1 |
| 124 | +2.5 | −0.1 | 152 | +3.1 | +0.2 |
| 125 | +0.7 | 0.0 | 153 | +0.9 | +0.1 |
| 126 | 0.0 | −0.5 | 154 | +0.9 | 0.0 |
| 127 | +0.1 | −0.5 | 155 | +1.7 | +0.5 |
| 128 | 0.0 | −0.6 | 156 | +2.2 | +0.4 |
| 129 | +1.5 | +0.1 | 157 | +3.1 | −0.2 |
| 130 | +1.8 | −0.3 | 158 | +1.1 | −0.3 |
| 131 | +0.4 | +0.1 | 159 | +2.2 | −0.3 |
| 132 | +2.4 | +0.6 | a 7447 1 | +2.2 | −0.1 |
| 133 | +3.4 | +0.5 | 2 | +1.6 | +0.3 |
| 134 | +3.1 | +0.5 | 3 | +1.1 | +0.2 |
| 135 | +3.2 | +0.1 | 4 | +4.0 | 0.0 |
| 136 | +1.3 | +1.5 | 5 | +0.3 | −0.2 |
| 137 | +2.3 | +0.5 | 6 | −0.5 | −0.2 |
| 138 | +0.8 | −0.1 | 7 | +2.7 | +0.2 |
| 139 | +2.2 | −0.1 | 8 | −0.4 | −0.2 |

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| No. of neb. | Diff. in $\alpha$ | Diff in $\delta$ | No. of neb. | Diff in $\alpha$ | Diff. in $\delta$ |
|---|---|---|---|---|---|
| a 7447 cont | | | | | |
| 9 | −0.1 | −0.3 | 36 | +0.4 | −0.1 |
| 10 | +1.0 | −0.3 | 37 | +0.3 | −0.1 |
| 11 | −0.6 | −0.5 | 38 | −0.2 | 0.0 |
| 12 | +0.8 | −0.3 | 39 | −1.4 | 0.0 |
| 13 | +0.3 | 0.0 | 40 | −0.4 | +0.4 |
| 14 | +1.0 | −0.1 | | | |
| 15 | +1.3 | 0.0 | | | |
| 16 | +1.8 | +0.1 | | | |
| 17 | +0.8 | −0.1 | | | |
| 18 | +1.1 | −0.2 | | | |
| 19 | +1.1 | −0.2 | | | |
| 20 | −0.2 | −0.2 | | | |
| 21 | −0.2 | −0.2 | | | |
| 22 | −0.5 | 0.0 | | | |
| 23 | +1.6 | −0.2 | | | |
| 24 | −1.6 | −0.2 | | | |
| 25 | +0.9 | +0.1 | | | |
| 26 | −*0.$\frac{3}{7}$ | +0.$\frac{7}{8}$ | | | |
| 27 | +0.2 | −0.1 | | | |
| 28 | +0.2 | 0.0 | | | |
| 29 | +3.1 | −0.4 | | | |
| 30 | +3.2 | −0.4 | | | |
| 31 | +0.4 | −0.2 | | | |
| 32 | +0.4 | 0.0 | | | |
| 33 | +2.7 | +0.2 | | | |
| 35 | +2.7 | +0.1 | | | |
| 44 | +2.7 | +0.2 | | | |
| 34 | −0.3 | 0.0 | | | |

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