

KG
11366
11374

$$2x \sqrt{r^2 - x^2} + 2x \frac{2x}{2\sqrt{r^2 - x^2}}$$

$$\sqrt{r^2 - x^2} + \frac{x^2}{\sqrt{r^2 - x^2}} = 0$$

$$r^2 - x^2 = -x^2$$

$$r^2 = 2$$

$$r^2$$

$$3\pi y^2$$

$$3\pi(r^2 - x^2) = 0$$

$$3\pi(r^2 - x^2)^{\frac{3}{2}}$$

$$\frac{9}{2}\pi(r^2 - x^2)^{\frac{5}{2}}$$

Almanac for 1862

Moore,

Oliver, Jan, Feb, March,

Kerr, April, May

Wright, June, July, August,

Bunkle, Sept, Oct, Nov, Dec,

Newcomb computed 35 days beginning with Jan. 1.

Oliver computed all of the arguments for first 3 months.

all of the longitudes with one week assistance from Newcomb and changed about two months from ^{long. & lat. 4} N. A. & Dec.

Newcomb computed all the latitudes from first three months from Oliver's and changed one month from long and lat to N. A. & Dec. was engaged on Oliver's work from Jan 31st to Feb 21st - three weeks.

Which would be equivalent to about half of one month of the Almanac, or to about \$150,00

Rad. curvature of Ellipse

$$D_{xy} = -\frac{B^2 x}{A^2 y}$$

$$\begin{aligned} \ddot{s}_{xy} &= \frac{D_{xy}^2 + (D_{xx})^2}{A^4 y^2} = \frac{-A^4 B^2 y^2 + A^2 B^4 x^2}{A^4 y^2} \\ &= -\frac{B^2 y^2 - B^4 x^2}{A^4 y^2} \\ &= -\frac{A^2 B^2 (A^2 y^2 + B^2 x^2)}{A^6 y^2} \\ &= -\frac{B^4}{A^4 y^3} \end{aligned}$$

Rad. curvature ~~is~~

$$r d\tau = ds$$

$$ds = dx \left(1 + \frac{dy^2}{dx^2}\right)^{\frac{1}{2}}$$

$$\begin{aligned} r &= \frac{ds}{d\tau} \\ &= \frac{\left(1 + \frac{dy^2}{dx^2}\right)^{\frac{3}{2}}}{\frac{d^2 y}{dx^2}} \end{aligned}$$

$$d\tau = \frac{\frac{d^2 y}{dx^2}}{1 + \frac{dy^2}{dx^2}}$$

$$ds = dx (1 + dy^2)^{\frac{1}{2}}$$

$$\frac{d\tau}{dy} = \frac{dy^2}{2}$$

By elong

$$y = (2rx - x^2)^{\frac{1}{2}} + r - \text{ordinate } (2rx - x^2)$$

$$dy = \frac{2r - x}{(2rx - x^2)^{\frac{1}{2}}} + \frac{(2x - 2x) dy}{4}$$

From Newcomb's experience 3 months
of the Moon Ephemeris can be
computed easily in four months and
one half, and even easily in four
months.

Mr. Wright began three months
after Jan 20, and reported it
complete for every 12 hours on the
7th of March = 46 days = $1\frac{1}{2}$ months,
and his estimate of the time for
computing the whole Ephemeris would be
3 months in three months.

Mr. Runkle reports March 7
that his four months will be
ready for lunar distances before
the end of this week

$$2\sqrt{r^2 - y^2}$$

$$\frac{-2x}{2\sqrt{r^2 - y^2}} = 0$$

$$2\sqrt{r^2 - y^2}^3$$

$$(r^2 - y^2)^{\frac{5}{3}}$$

$$\frac{2}{3}(r^2 - y^2)^{-\frac{1}{3}} 2x dy$$

$$\frac{1}{3} \frac{2x}{(r^2 - y^2)^{\frac{1}{3}}}$$

Mon for 1864.

Rebiler Jan Feb, March

Fersel April, May, June

1600 n
 1200 min
 1500 alim
 1200
 5500.

$$w = xyz = xy\sqrt{a^2 - x^2 - y^2}$$

$$\frac{dw}{dy} = y\sqrt{a^2 - x^2 - y^2} - \frac{x^2 y}{\sqrt{a^2 - x^2 - y^2}}$$

$$\frac{dw}{dy} = \frac{x}{\sqrt{a^2 - x^2 - y^2}} - \frac{x^3}{\sqrt{a^2 - x^2 - y^2}}$$

$$\frac{dw}{dx} = \frac{y(a^2 - x^2 - y^2 - x^2)}{\sqrt{a^2 - y^2 - x^2}} = \frac{y}{\sqrt{a^2 - y^2 - x^2}} (a^2 - 2x^2 - y^2)$$

$$\frac{dw}{dy} = \frac{x}{\sqrt{a^2 - x^2 - y^2}} (a^2 - 2y^2 - x^2)$$

$$\frac{dw}{dx} = 0 \quad \frac{dw}{dy} = 0$$

$$a^2 - 2y^2 - x^2 = 0$$

$$a^2 - 2x^2 - y^2 = 0$$

$$-3y^2 + x^2 = 0$$

$$y^2 = x^2$$

$$y = x$$

$$a^2 - 3x^2 = 0$$

$$x^2 = \frac{a^2}{3}$$

Nov. 18. 1865. Mr Will thinks that
 a month of Lunar Ephemers ^{and} ~~including~~
 Lunar distances preparation of
 Copy and sending of Proofs can
 be done by one person working
 moderately in two months, and
 that the work on the ephemeris
 is about equal to that on the
 Lunar Distances. So better that
 the whole could be done at that
 rate.

One person can do the whole star
 ephemeris in 4 months ^{including} ~~except~~
 making out the Copy. Stars Constants
 in two weeks, Moon Culminations Stars
 one week. Proofs two weeks total
 that is the whole star work is a
 four months job for 1 person.
 Mr Will estimates

1869 Express

Bundle from Westminster

Box instruments

Desk to Boston

Jan 19 Bundle of books to Gardener

Jan 26

Table for dome chamber
from Boston

Coat to Boston

Sir Howard Douglas. Naval Gunnery
 p. 23

The theory of gunnery in its present state is admitted to be insufficient to serve as a basis for the practice of the artillerist; yet it may be not unreasonably expected that the theory will ultimately be carried to a degree of perfection corresponding to that which has been attained in other departments of physical science. It should be borne in mind that this object can be gained only by a diligent cultivation of the theory itself; and it may be added that it is only a scientific member of the profession who can direct experiments tending to useful results, or ~~can~~ can advantageously introduce informal the data which the experiments furnish.

p. 25 Numerical determination of point is a more difficult. An officer confining himself to the subject of ranges only would probably prefer making approximation interpolations between the ranges which have been experimentally determined. Yet even this comparatively simple process cannot be effectively accomplished without a knowledge of the principles on which the ranges are investigated, and an officer of the artillery should no more be ignorant of these than

Section Trans de Ballistique
calculs indispensables

than with the important diseases which, in
gunnery relate to construction and armament
he treats the Parabola analytically as
Poisson. h 26

P. 31 The Ballistic pendulum and
experiments therewith treated analytically,
the Calculus is used
Resistance of the air treated by means
of the Calculus h 36. 37

Measure for the velocity of a shot in
terms of the charge of powder employed
by means of Calculus page 39.

On penetration of shot and resistance
reference is made to Poncet, Poisson
Le Genche &c, to whom the subject is
treated analytically. h. 56

A simple expression is obtained by
developing by means of Mr. Lacroix's theorem
h 57

Lateral deviation of projectiles h 65 - tangent
analysis is introduced

On cylindro-conoidal and Excentric spherical
Projectiles Calculus used h 149, and Vires
Fluxions and single tracts referred to.

Naval Academy &c. p. 16.
 all the above classes of officers study,
 under a very able professor, the higher
 branches of Mathematics including Astronomy,

$$\begin{array}{r} 24 \\ + 2 \\ \hline \end{array}$$

$$\begin{array}{r} 24 \\ 6 \\ \hline 12 \\ 72 \end{array}$$

$$\begin{array}{r} 15 \\ \hline 72 \end{array}$$

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