Equation of comet units in million kilometres

focus (0,0) focal length = 320 million km centre (320,0)

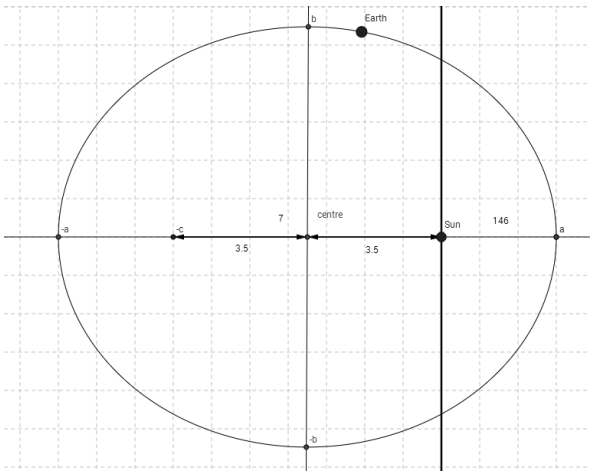
$-y^2 = 4a(x - x_1)$ $-y^2 = 4 \times 320(x - 320)$

$-y^2 = 1280(x - 320)$ $y^2 = -1280(x - 320)$

1

Equation for the earth

Foci (0,0) and (7,0) closest earth gets to sun 146 million km



a = 149.5 b = ? c = 3.5 $b^2 = a^2 - c^2$

$b^2 = 149^2 - 3.5^2 = 22188.75$ b = 148.9589 = 149 million km

$\frac{(x - x_1)^2}{a^2} + \frac{y^2}{b^2} = 1$ $\frac{(x+3.5)^2}{149.5^2} + \frac{y^2}{149^2} = 1$ $\frac{(x+3.5)^2}{22350.25} + \frac{y^2}{22188.75} = 1$

2

When the asteroid crosses the orbit of the comet it is 640 million kms from the sun

x = 0 y^2 = -1280(0-320) = 409600

y = 640 million km

3

When the asteroid crosses the orbit of the earth *x* = 0

$\frac{(x+3.5)^2}{149.5^2} + \frac{y^2}{149^2} = 1$ $\frac{(0+3.5)^2}{149.5^2} + \frac{y^2}{149^2} = 1$

$5.4809 \times 10^{-4} + \frac{y^2}{149^2} = 1$ $\frac{y^2}{149^2} = -5.4809 \times 10^{-4}$

y^2 = -12.168 *y* =