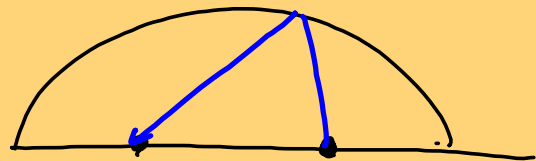
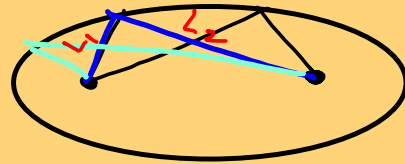
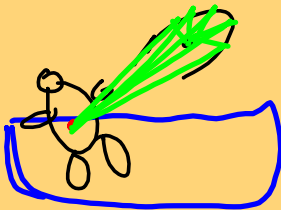
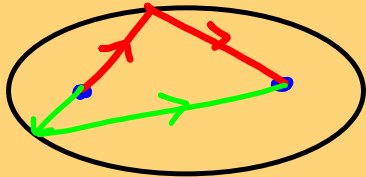


# ELLIPSES

foci

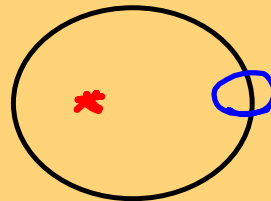
- the set of points in which the sum of the distances from two given points is constant.

Reflective Property

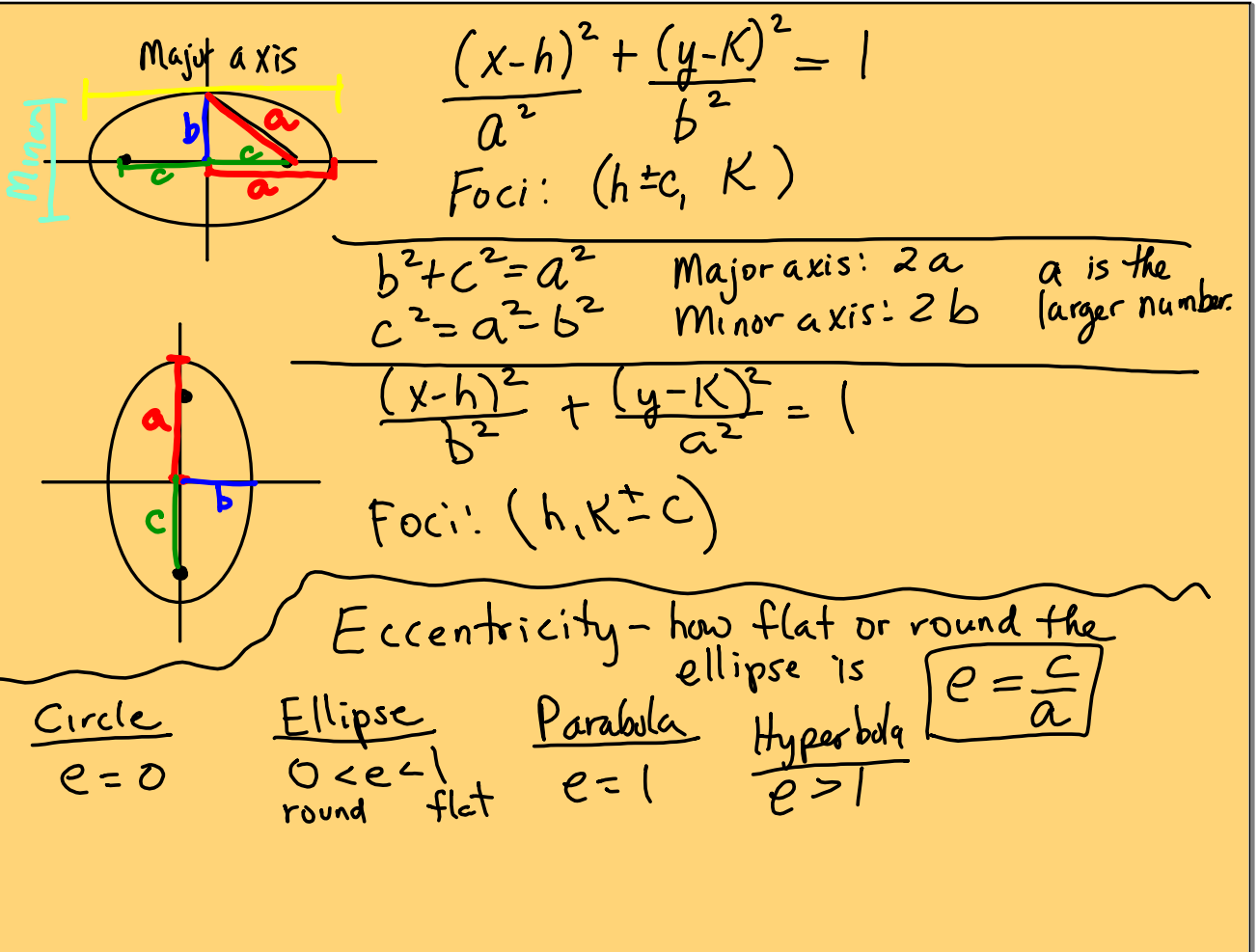


whispering gallery  
lithotripsy

Telescope/Microscope  
Orbits of planets



Shape of earth = ellipsoid



$$25x^2 + 4y^2 - 150x - 40y + 225 = 0$$

$$25x^2 - 150x + 4y^2 - 40y = -225$$

$$25(x^2 - 6x + 9) + 4(y^2 - 10y + 25) = -225 + 225 + 100$$

$$\frac{25(x-3)^2}{100} + \frac{4(y-5)^2}{25} = \frac{100}{100}$$

$$\frac{(x-3)^2}{4} + \frac{(y-5)^2}{25} = 1$$

Center: (3, 5)

$$a = \sqrt{25} = 5$$

$$b = \sqrt{4} = 2$$

Vertical (big # under y)

$$c^2 = a^2 - b^2$$

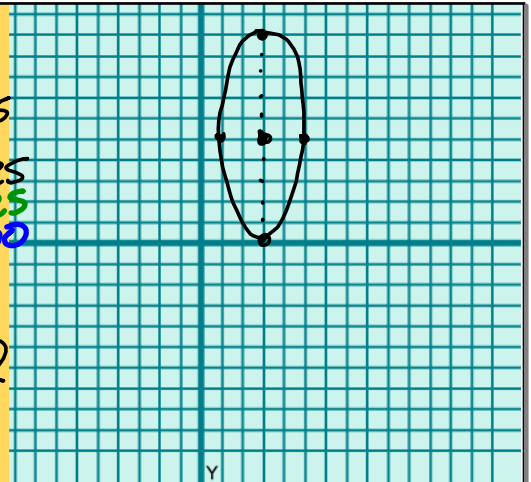
$$c^2 = 25 - 4$$

$$\sqrt{c^2} = \sqrt{21}$$

$$\text{Major} = 2a = 2(5) = 10$$

$$\text{Minor} = 2b = 2(2) = 4$$

$$\text{Foci: } (h, k \pm c) = (3, 5 \pm \sqrt{21})$$



To graph:

1) Plot center, a, b