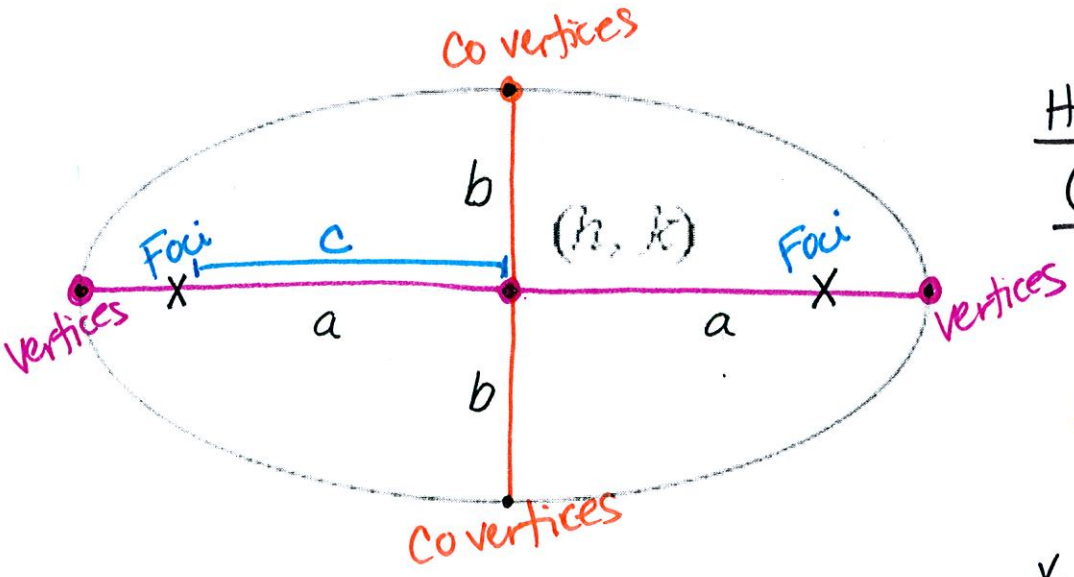
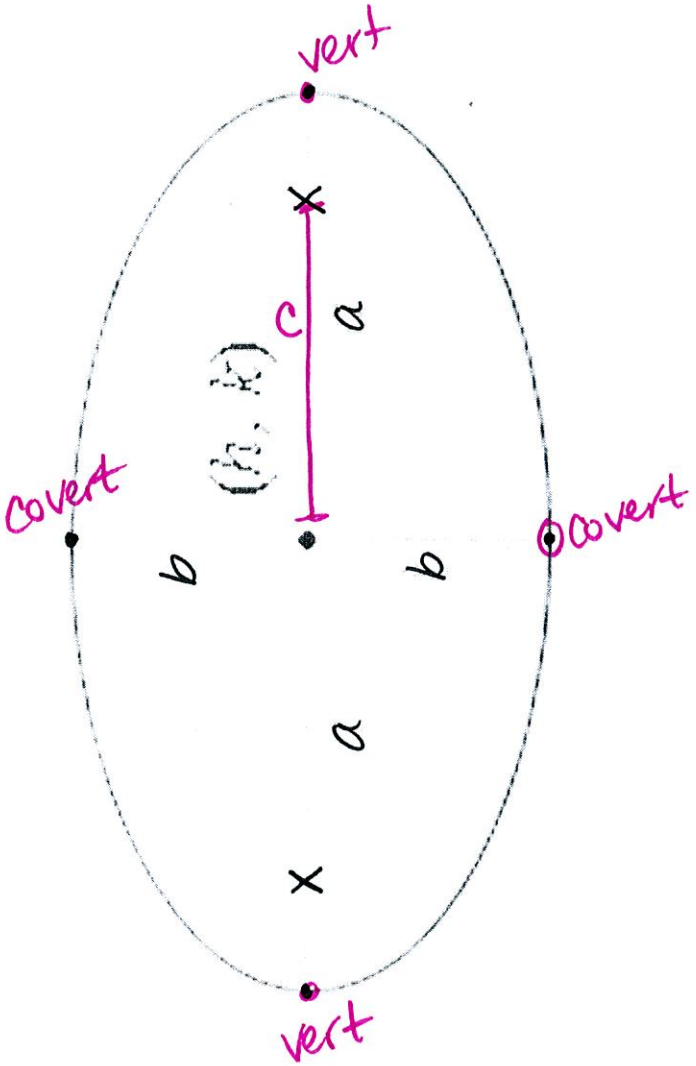


HORIZONTAL

$$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$$

* a^2 is always larger number

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



Vertical

$$\frac{(x-h)^2}{b^2} + \frac{(y-k)^2}{a^2} = 1$$

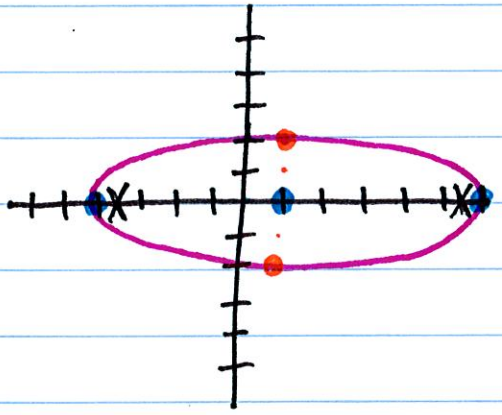
Ellipses

center: (opp h, opp K)
vertices: a ⟶ from center (under x = horiz.; under y = vert.)
covertices: b ⟶ from center
major axis: 2a
minor axis: 2b
foci: c ⟶ from center (always toward vertices ⇒ a)

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

Example 1: Graph $\frac{(x-1)^2}{25_{a^2}} + \frac{y^2}{4_{b^2}} = 1$ $a = 5$ horiz. $b = 2$

center: (1, 0)
vertices: (6, 0) (−4, 0)
covertices: (1, 2) (1, −2)
foci: (−3.6, 0) (5.6, 0)
major axis: 2(5) = 10
minor axis: 2(2) = 4



Foci w/ no calculator: Find c

$$c^2 = a^2 - b^2$$
$$c^2 = 25 - 4$$
$$\sqrt{c^2} = \sqrt{21}$$
$$c = 4.6$$