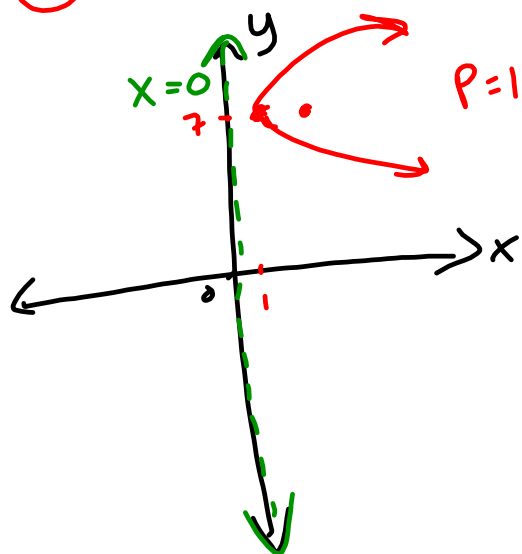


WARM-UP

① Vertex $(1, 7)$ Directrix: $x = 0$



$$(y-7)^2 = 4(1)(x-1)$$

$$(y-7)^2 = 4(x-1)$$

② Center: $(1, 2)$
Point: $(4, -5)$

$$(x-1)^2 + (y-2)^2 = 58$$

$$(x-h)^2 + (y-k)^2 = r^2$$

$$(x-1)^2 + (y-2)^2 = r^2$$

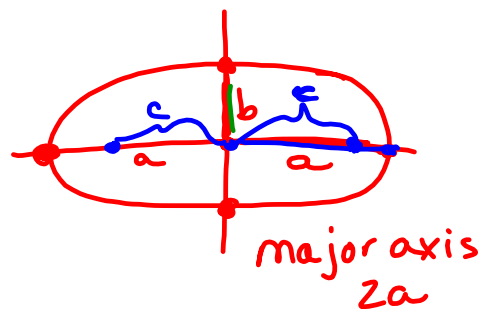
$$(4-1)^2 + (-5-2)^2 = r^2$$

$$9 + 49 = r^2$$

$$58 = r^2$$

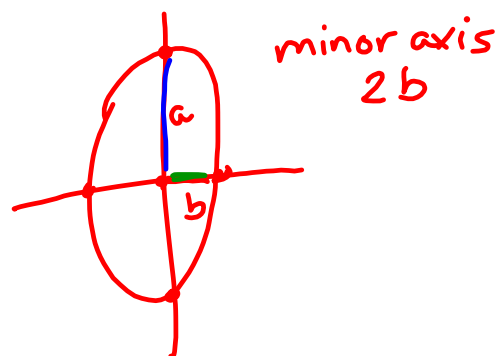
9.2 Ellipse

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



$$a > b$$

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



$$\frac{x^2}{4} + \frac{y^2}{4} = 4$$

$$\frac{x^2}{4} + \frac{y^2}{4} = 1$$

$$\frac{x^2}{4} + \frac{y^2}{4} = 1$$

(EX1) Find the center, vertices and foci of the ellipse given by

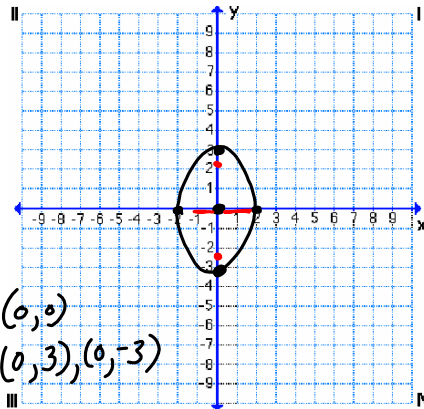
$$\frac{9x^2}{36} + \frac{4y^2}{36} = \frac{36}{36}$$

$$\frac{x^2}{4} + \frac{y^2}{9} = 1$$

$$\frac{y^2}{9} + \frac{x^2}{4} = 1$$

$$\begin{aligned} a &= 3 \\ b &= 2 \end{aligned}$$

$$\begin{aligned} a^2 &= b^2 + c^2 \\ 9 &= 4 + c^2 \\ 5 &= c^2 \\ \pm\sqrt{5} &= c \end{aligned}$$



Center $(0,0)$

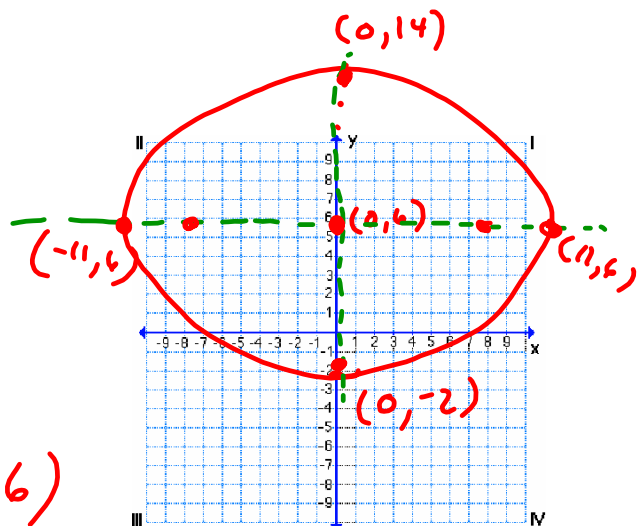
Vertices $(0,3), (0,-3)$

Co-vertices $(2,0), (-2,0)$

Foci $(0, \sqrt{5}), (0, -\sqrt{5})$

b)
$$\frac{x^2}{121} + \frac{(y-6)^2}{64} = 1$$

$$\begin{aligned} a &= 11 & a^2 &= b^2 + c^2 \\ b &= 8 & 121 &= 64 + c^2 \\ & & 57 &= c^2 \\ & & \pm\sqrt{57} &= c \end{aligned}$$



Center $(0,6)$

Vertices $(0,14), (0,-2)$

Co-vertices $(11,6), (-11,6)$

Foci $(0, 6 + \sqrt{57}), (0, 6 - \sqrt{57})$