

①

ELLIPSES

$$\frac{x^2}{16} + \frac{y^2}{9} = 1$$

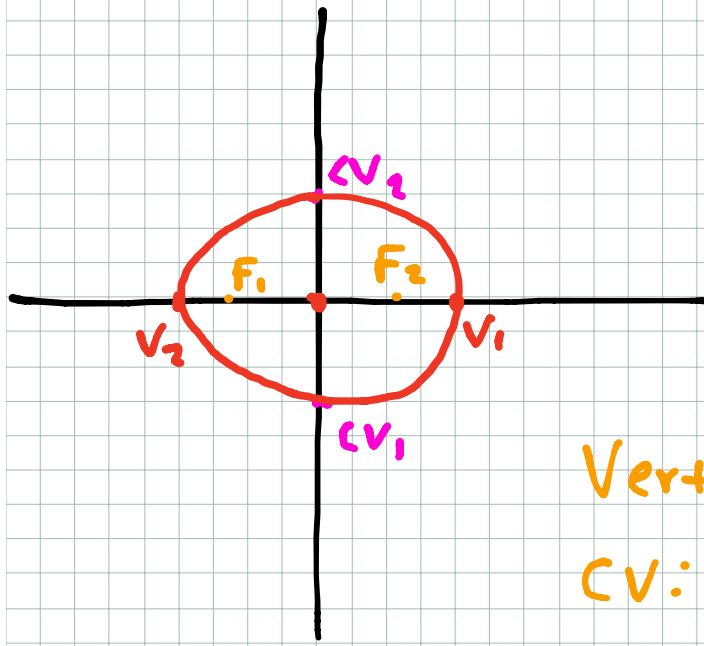
a^2
 b^2

Major

$a = 4$

$b = 3$

$f = \sqrt{7}$ e.b



$f^2 = a^2 - b^2$

$f^2 = 16 - 9$

$f^2 = 7$

$f = \sqrt{7}$

Vertices: $(4, 0)$ $(-4, 0)$

CV: $(0, 3)$ $(0, -3)$

Foci: $(\pm\sqrt{7}, 0)$

$(\sqrt{7}, 0)$ $(-\sqrt{7}, 0)$

②

$$\frac{x^2}{9} + \frac{y^2}{49} = 1$$

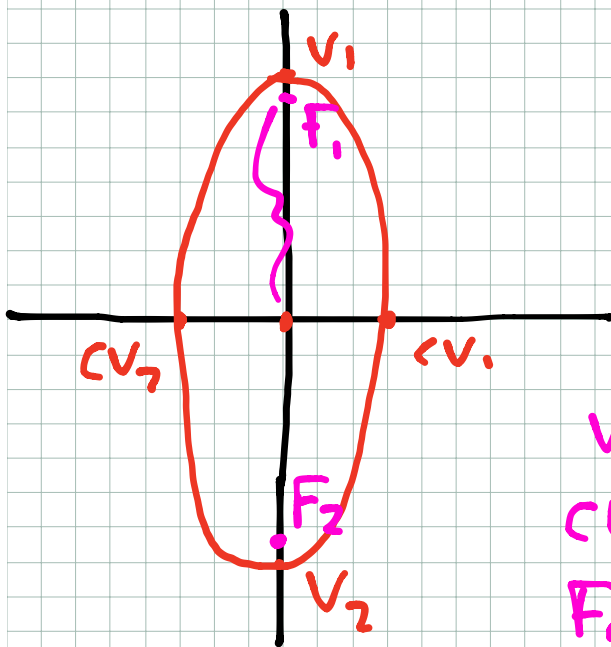
b^2
 a^2

Major

$a = 7$

$b = 3$

$F = \sqrt{40}$



$$f^2 = a^2 - b^2$$

$$f^2 = 40$$

$$f = \sqrt{40}$$

6.???

$$V: (0, 7)(0, -7)$$

$$CV: (-3, 0)(3, 0)$$

$$\text{Foci: } (0, \sqrt{40})$$

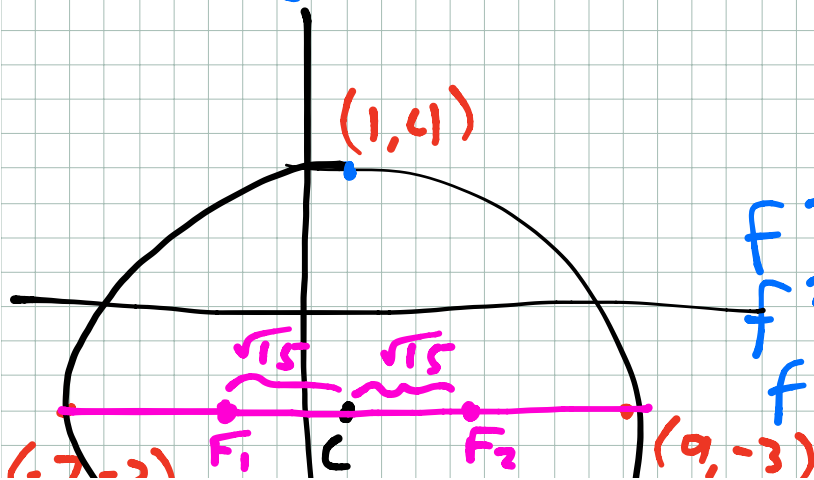
$$(0, -\sqrt{40})$$

3

$$\frac{(x-1)^2}{64} + \frac{(y+3)^2}{49} = 1$$

Bigger

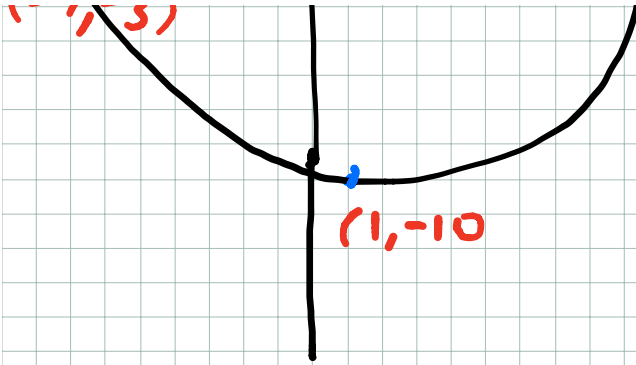
$$\begin{aligned} a &= 8 \\ b &= 7 \\ f &= \sqrt{15} \end{aligned}$$



$$f^2 = 64 - 49$$

$$f^2 = 15$$

$$f = \sqrt{15}$$



$$C: (1, -3)$$
$$V: (9, -3)$$
$$(-7, -3)$$

$$CV: (1, 4)$$
$$(1, -10)$$

$$F: (1 + \sqrt{15}, -3)$$
$$(1 - \sqrt{15}, -3)$$

$$F: (1 \pm \sqrt{15}, -3)$$

PRACTICE:

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

$$a = 5$$
$$b = 2$$
$$f = \sqrt{21}$$

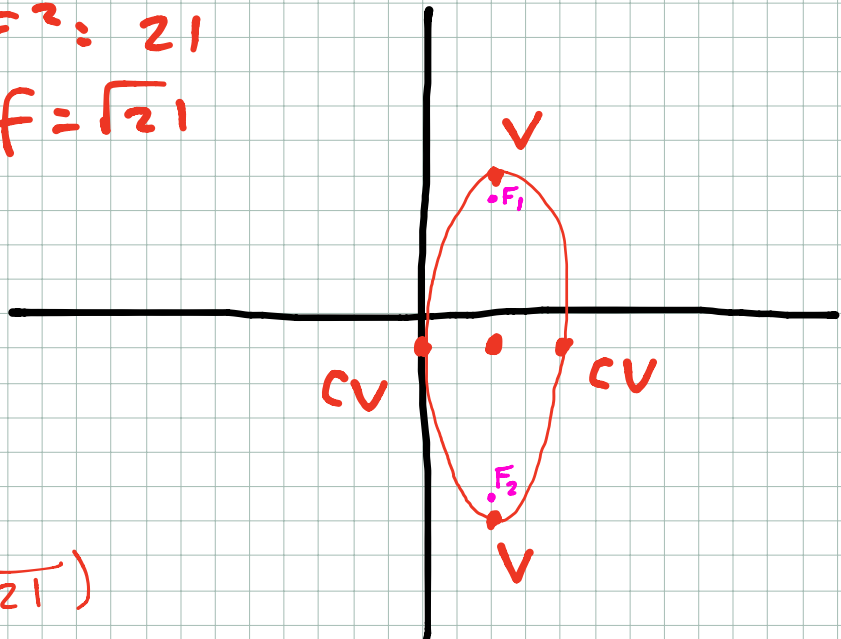
$$F^2 = 25 - 4$$
$$F^2 = 21$$
$$f = \sqrt{21}$$

$$C: (2, -1)$$

$$V: (2, 4)$$
$$(2, -6)$$

$$CV: (4, -1)$$
$$(0, -1)$$

$$F: (2, -1 \pm \sqrt{21})$$



$$\textcircled{2} \frac{(x-4)^2}{36} + \frac{(y+2)^2}{9} = 1$$

$$a = 6 \quad f^2 = 36 - 9$$

$$b = 3 \quad f^2 = 27$$

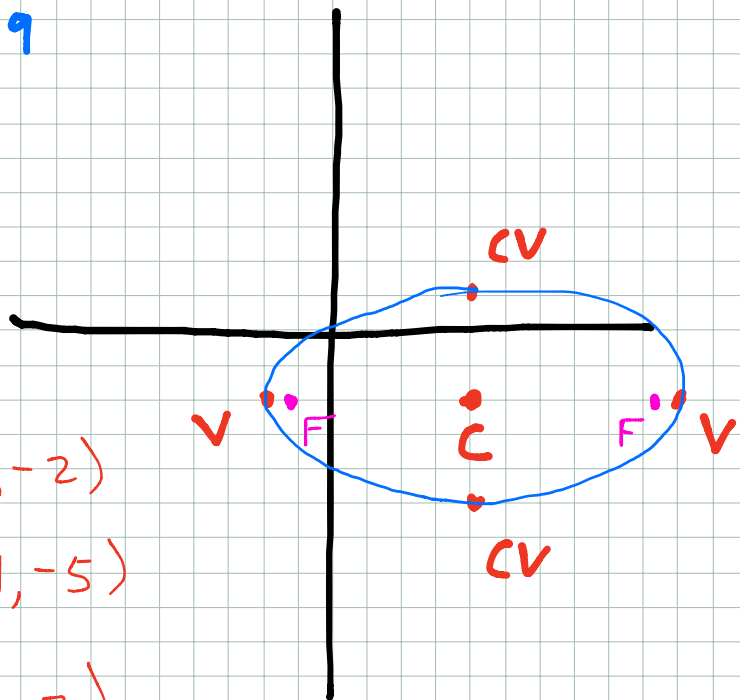
$$f = \sqrt{27} \quad f = \sqrt{27}$$

$$\text{Center: } (4, -2)$$

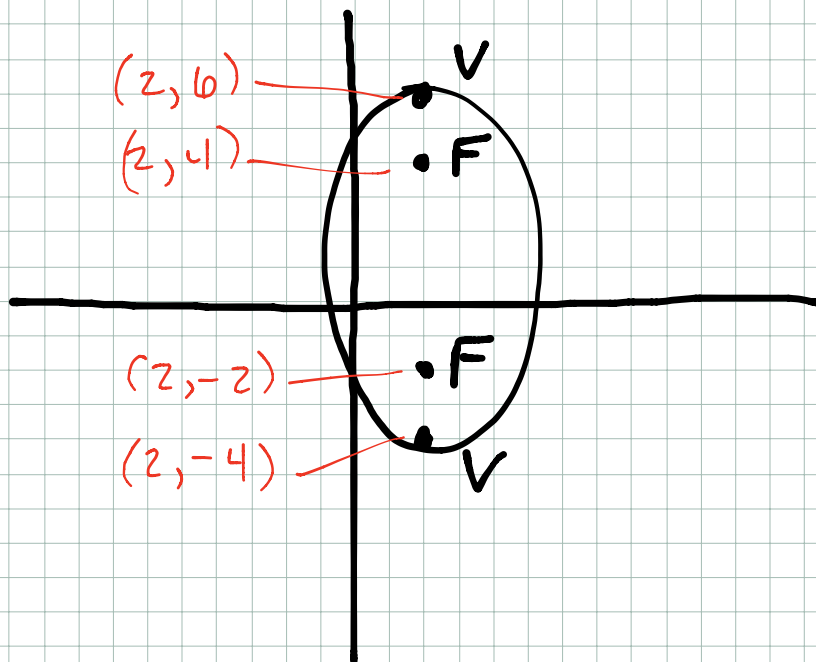
$$\text{Vertices: } (10, -2) (-2, -2)$$

$$\text{Co-Vertices: } (4, 1) (4, -5)$$

$$\text{Foci: } (4 \pm \sqrt{27}, -2)$$



WRITE THE EQUATION.



Center: (2, 1)

$$\frac{(x-2)^2}{16} + \frac{(y-1)^2}{25} = 1$$

$$\begin{aligned} a &= 5 \\ b &= 3 \\ f &= 3 \end{aligned}$$

$$f^2 = a^2 - b^2$$

$$\begin{aligned} 9 &= 25 - b^2 \\ -25 &= -25 - b^2 \\ -16 &= -b^2 \end{aligned}$$

$$b^2 = 16$$

$$2x^2 + 3y^2 - 8x + 6y + 5 = 0$$

$$(2x^2 - 8x) + (3y^2 + 6y) = -5$$

$$2(x^2 - 4x + \boxed{4}) + 3(y^2 + 2y + \boxed{1}) = -5 + \boxed{8} + \boxed{3}$$

$(-2)^2$ $(1)^2$ ~~4~~ ~~3~~

$$\frac{2(x-2)^2}{2} + \frac{3(y+1)^2}{3} = \frac{6}{6}$$

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