

ECCENTRICITY: (c/a) how round an ellipse is

(the closer the eccentricity is to zero
the closer the ellipse is to a circle)

Ex #1: Graph the ellipses. Find the foci, vertices, and eccentricity.

$$a) \frac{x^2}{9} + \frac{y^2}{25} = 1$$

$$a = 5$$

$$b = 3$$

$$c = 4$$

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

$$c^2 = 25 - 9$$

$$c^2 = 16$$

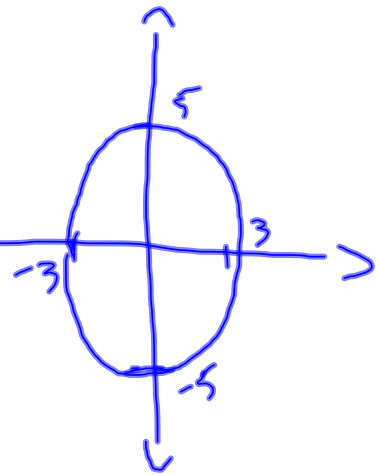
$$c = 4$$

$$C: (0, 0)$$

$$V: (0, 5) (0, -5)$$

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

$$E: \frac{4}{5}$$



$$b) \frac{x^2}{144} + \frac{y^2}{169} = 1$$

$$a = 13$$

$$b = 12$$

$$c = 5$$

$$169 - 144$$

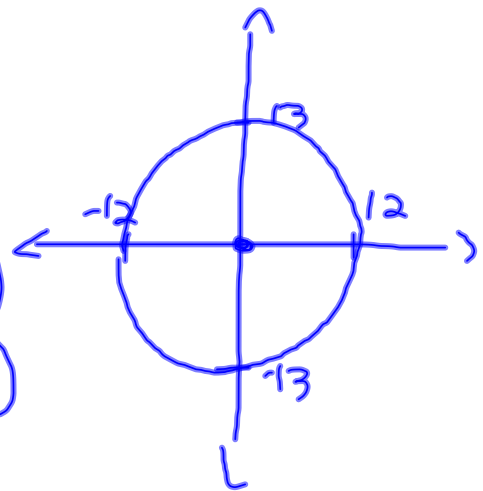
$$25$$

$$C: (0, 0)$$

$$V: (0, 13) (0, -13)$$

$$F: (0, 5) (0, -5)$$

$$E: \frac{5}{13}$$



$$c) \frac{49x^2}{3136} + \frac{64y^2}{3136} = \frac{3136}{3136}$$

$$\frac{x^2}{64} + \frac{y^2}{49} = 1$$

$$a=8$$

$$b=7$$

$$c=\sqrt{15}$$

$$64-49$$

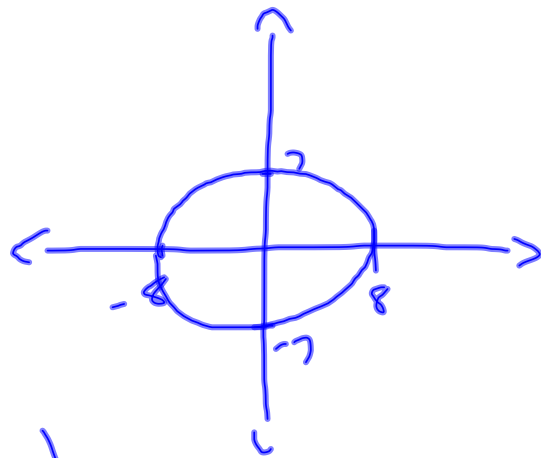
$$15$$

$$C: (0,0)$$

$$V: (8,0) (-8,0)$$

$$F: (\sqrt{15},0) (-\sqrt{15},0)$$

$$E: \frac{\sqrt{15}}{8}$$



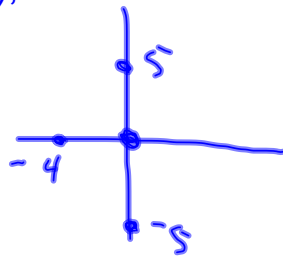
Ex #2: Find an equation of the ellipse.

- a) The center is $(0,0)$, a vertex is $(0,5)$, and a co-vertex is $(-4,0)$.

$$a=5$$
$$b=4$$

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

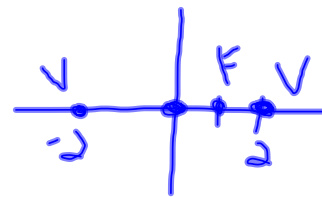
$$\frac{x^2}{16} + \frac{y^2}{25} = 1$$



b) Center is (0,0), a vertex is (2,0), and a focus is (1,0)

$$\begin{aligned} a &= 2 \\ b &= \sqrt{3} \\ c &= 1 \end{aligned}$$

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



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

$$1 = 4 - b^2$$

$$-3 = -b^2$$

$$3 = b^2$$

$$\sqrt{3} = b$$

$$\frac{x^2}{4} + \frac{y^2}{3} = 1$$

Assign# 30

pg586 #7-13 odd, 14,
19-39 odd