

$$4. \quad x^2 + 15y^2 = 45$$

$$\frac{x^2}{45} + \frac{15y^2}{45} = \frac{45}{45}$$

$$\frac{x^2}{45} + \frac{y^2}{3} = 1$$

$$\overset{h=0}{\frac{(x-0)^2}{(\sqrt{45})^2}} + \overset{k=0}{\frac{(y-0)^2}{(\sqrt{3})^2}} = 1$$

$$\downarrow$$

$$a = \sqrt{45}$$

$$a = 3\sqrt{5}$$

$$\downarrow$$

$$b = \sqrt{3}$$

$$c = \sqrt{a^2 - b^2}$$

$$= \sqrt{45 - 3}$$

$$= \sqrt{42}$$

LFST

$$a = 3\sqrt{5}$$

$$\approx 6.7$$


$$b = \sqrt{3}$$

$$\approx 1.7$$

$$c = \sqrt{42}$$

$$h=0 \quad k=0$$

$$\text{CENTER: } (h, k) = (0, 0)$$

MAJOR AXIS 

$$\text{LENGTH MAJOR AXIS: } 2a = 2(6.7) \approx 13.4$$

$$\text{LENGTH MINOR AXIS: } 2b = 2(1.7) = 3.4$$

$$\text{FOCI: } (h+c, k) \quad (h-c, k)$$

$$(0 + \sqrt{42}, 0) \quad (0 - \sqrt{42}, 0)$$

$$(\sqrt{42}, 0) \quad (-\sqrt{42}, 0)$$

$$\text{VERTICES: } (h+a, k) \quad (h-a, k)$$

$$(0 + 3\sqrt{5}, 0) \quad (0 - 3\sqrt{5}, 0)$$

$$(3\sqrt{5}, 0) \quad (-3\sqrt{5}, 0)$$

$$(6.7, 0) \quad (-6.7, 0)$$

