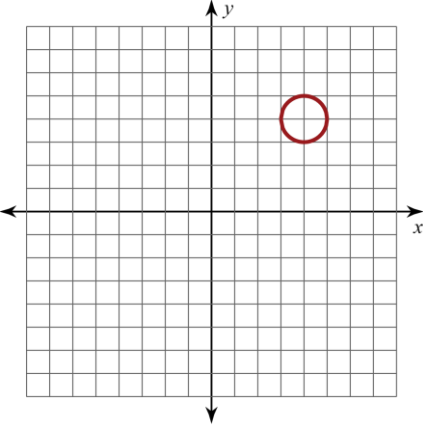
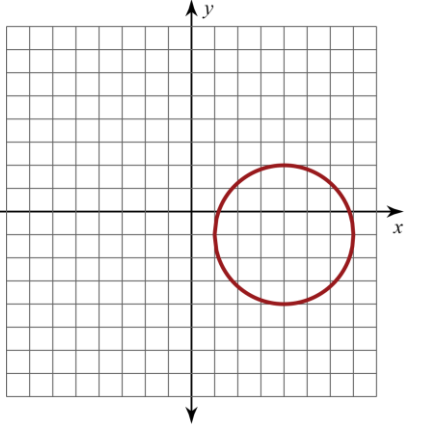
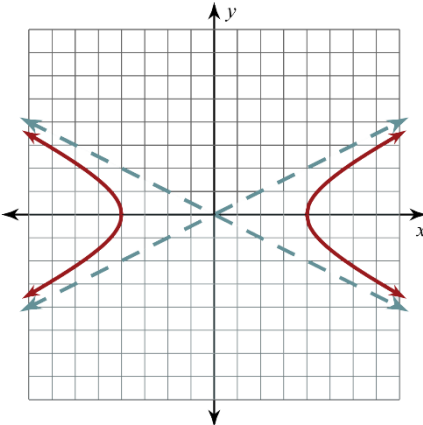
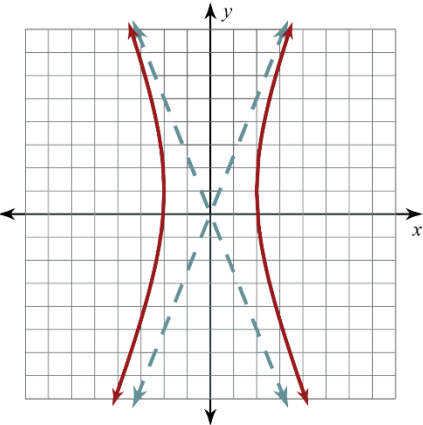


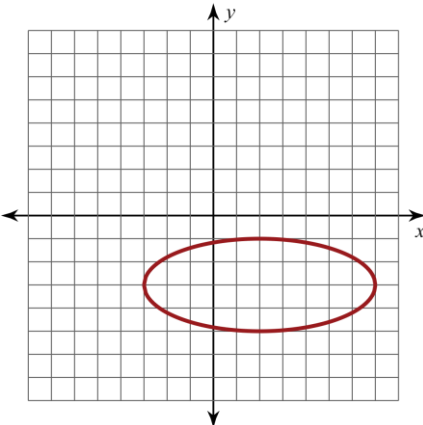
CONIC SECTIONS – CIRCLES

General	Practice	
Key Features	Equation and Key Features	Sketch
$(x-h)^2 + (y-k)^2 = 1$ <p>Center: (h , k)</p> <p>Radius: r</p>	$(x-4)^2 + (y-4)^2 = 1$ <p>Center: (4 , 4)</p> <p>Radius: 1</p>	
$x^2 + y^2 = r^2$ <p>Center: (0 , 0)</p> <p>Radius: r</p>	$(x-4)^2 + (y+1)^2 = 9$ <p>Center: (4 , -1)</p> <p>Radius: 3</p>	

CONIC SECTIONS – HYPERBOLA

General	Practice	
Key Features	Equation and Key Features	Sketch
$\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$ <p>Center: (h , k)</p> <p>Asymptotes: $y = \frac{b}{a}(x-h)+k$ & $y = -\frac{b}{a}(x-h)+k$</p> <p>Vertices: ($h+a$, k) & ($h-a$, k)</p>	$\frac{x^2}{16} - \frac{y^2}{4} = 1$ <p>Center: (0 , 0)</p> <p>Asymptotes: $y = \frac{1}{2}x$ & $y = -\frac{1}{2}x$</p> <p>Vertices: (4 , 0) & (-4 , 0)</p>	
$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ <p>Center: (0 , 0)</p> <p>Asymptotes: $y = \frac{b}{a}x$ & $y = -\frac{b}{a}x$</p> <p>Vertices: (a , 0) & ($-a$, 0)</p>	$\frac{x^2}{4} - \frac{y^2}{25} = 1$ <p>Center: (0 , 0)</p> <p>Asymptotes: $y = \frac{5}{2}x$ & $y = -\frac{5}{2}x$</p> <p>Vertices: (2 , 0) & (-2 , 0)</p>	

CONIC SECTIONS – ELLIPSE

General	Practice	
Key Features	Equation and Key Features	Sketch
$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$ <p>Center: (h , k)</p> <p>If $a > b$, then major axis: parallel to x-axis, length is $2a$ minor axis: length is $2b$</p> <p>If $b > a$, then major axis: parallel to y-axis, length is $2b$ minor axis: length is $2a$</p>	$\frac{(x-2)^2}{25} + \frac{(y+3)^2}{4} = 1$ <p>Center: (3 , -3)</p> <p>Major axis: parallel to the y-axis</p> <p>Length of major axis: 10</p> <p>Length of minor axis: 4</p>	

General

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

Center: (0 , 0)

If $a > b$, then

major axis: parallel to x -axis, length is $2a$

minor axis: length is $2b$

If $b > a$, then

major axis: parallel to y -axis, length is $2b$

minor axis: length is $2a$

Practice

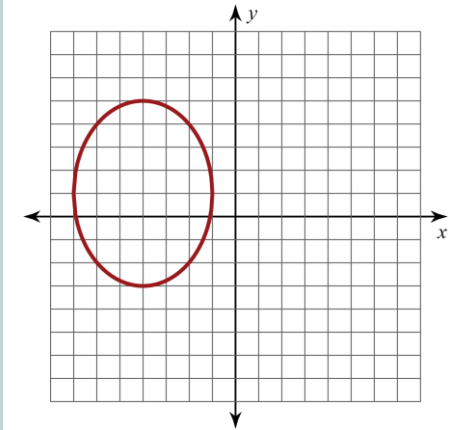
$$\frac{(x+4)^2}{9} + \frac{(y-2)^2}{16} = 1$$

Center: (-4 , 1)

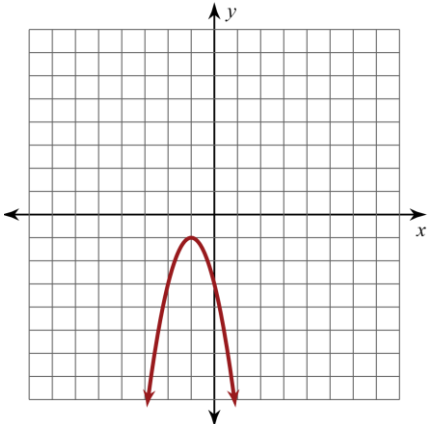
Major axis: parallel to the y -axis

Length of major axis: 8

Length of minor axis: 6



CONIC SECTIONS – PARABOLA

General	Practice	
Key Features	Equation and Key Features	Sketch
$y = a(x-h)^2 + k$ <p>Vertex: (h, k) When $a > 0$, opens: up When $a < 0$, opens: down Focus: $\left(h, k + \frac{1}{4a}\right)$ Directrix: $y = k - \frac{1}{4a}$</p>	$y = -2(x+1)^2 - 1$ <p>Vertex: $(-1, -1)$ Opens: down Focus: $\left(-1, -\frac{9}{8}\right)$ Directrix: $y = -\frac{7}{8}$</p>	
$x = a(y-k)^2 + h$ <p>Vertex: (h, k) When $a > 0$, opens: right When $a < 0$, opens: left Focus: $\left(h + \frac{1}{4a}, k\right)$ Directrix: $x = h - \frac{1}{4a}$</p>	$x = 2(y+1)^2 - 2$ <p>Vertex: $(-2, -1)$ Opens: right Focus: $\left(-\frac{15}{8}, -1\right)$ Directrix: $x = -\frac{17}{8}$</p>	