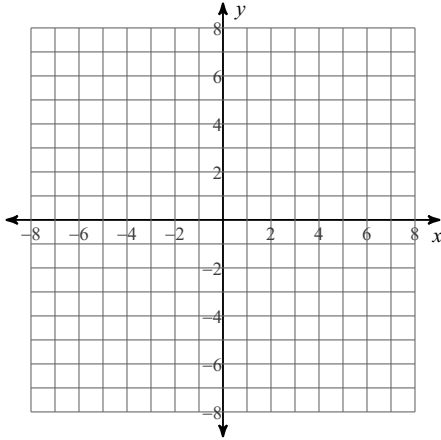


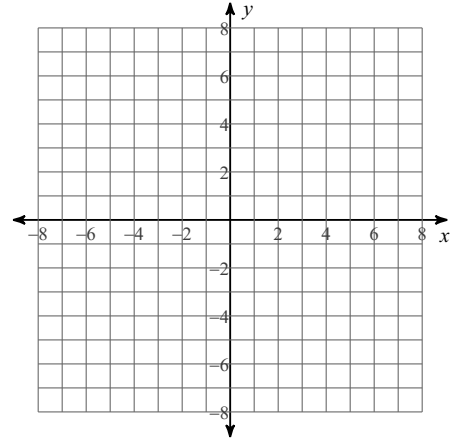
# Hyperbolas

Identify the vertices and foci of each. Then sketch the graph.

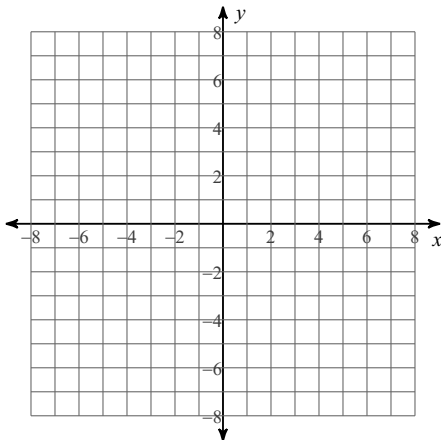
1)  $\frac{(y-1)^2}{4} - (x+4)^2 = 1$



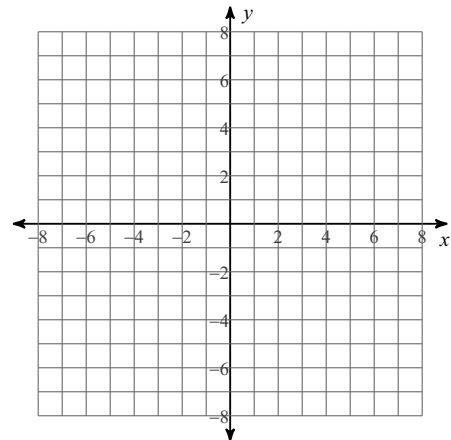
2)  $\frac{x^2}{4} - \frac{(y+1)^2}{16} = 1$



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



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



Use the information provided to write the standard form equation of each hyperbola.

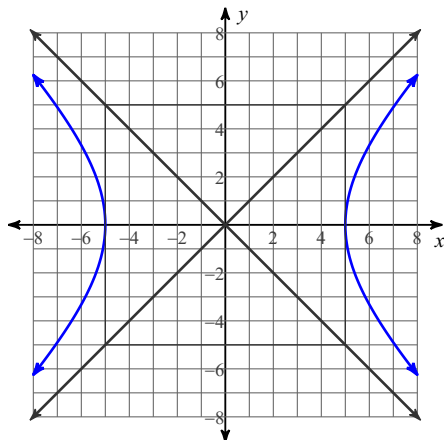
- 5) Vertices:  $(9, 15), (9, -3)$   
 Endpoints of Conjugate Axis:  $(18, 6)$   
 $(0, 6)$

- 6) Vertices:  $(6, 8), (6, -12)$   
 Endpoints of Conjugate Axis:  $(16, -2)$   
 $(-4, -2)$

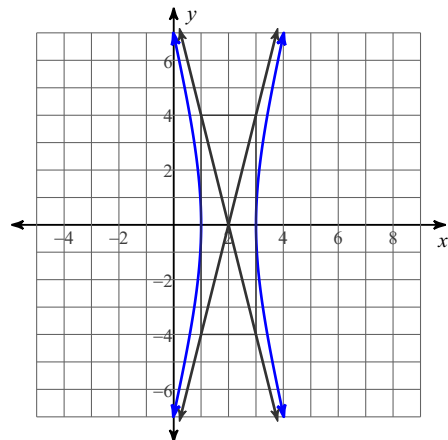
- 7) Vertices:  $(10, 10), (-8, 10)$   
 Foci:  $(1 + \sqrt{97}, 10), (1 - \sqrt{97}, 10)$

- 8) Vertices:  $(-9, 17), (-9, 1)$   
 Foci:  $(-9, 9 + \sqrt{185}), (-9, 9 - \sqrt{185})$

9)



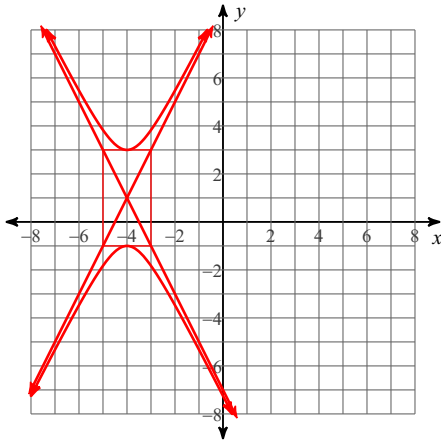
10)



# Hyperbolas

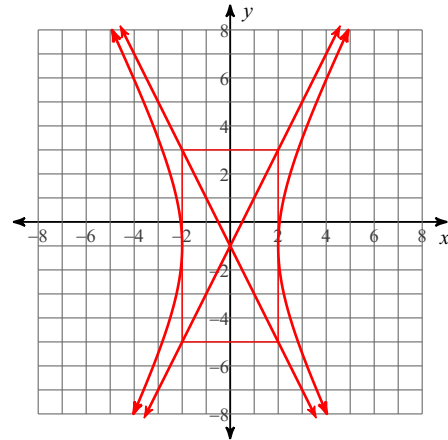
Identify the vertices and foci of each. Then sketch the graph.

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



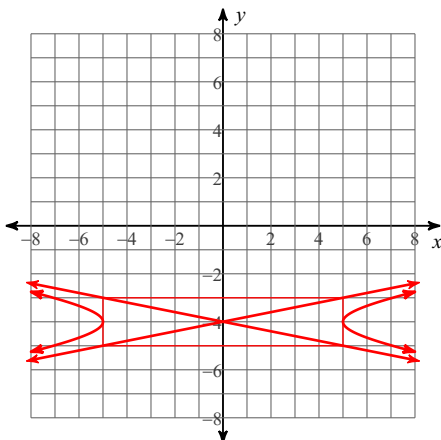
Vertices:  $(-4, 3)$   
 $(-4, -1)$   
 Foci:  $(-4, 1 + \sqrt{5})$   
 $(-4, 1 - \sqrt{5})$

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



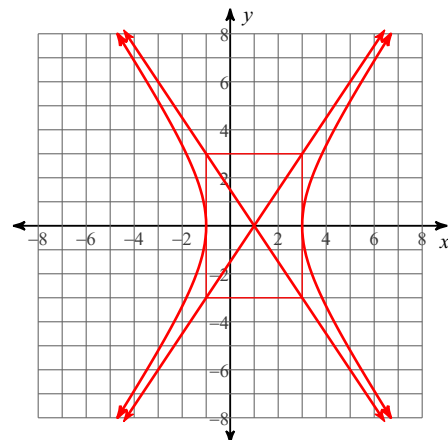
Vertices:  $(2, -1)$   
 $(-2, -1)$   
 Foci:  $(2\sqrt{5}, -1)$   
 $(-2\sqrt{5}, -1)$

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



Vertices:  $(5, -4)$   
 $(-5, -4)$   
 Foci:  $(\sqrt{26}, -4)$   
 $(-\sqrt{26}, -4)$

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



Vertices:  $(3, 0)$   
 $(-1, 0)$   
 Foci:  $(1 + \sqrt{13}, 0)$   
 $(1 - \sqrt{13}, 0)$

Use the information provided to write the standard form equation of each hyperbola.

- 5) Vertices:  $(9, 15), (9, -3)$   
 Endpoints of Conjugate Axis:  $(18, 6)$   
 $(0, 6)$

$$\frac{(y-6)^2}{81} - \frac{(x-9)^2}{81} = 1$$

- 6) Vertices:  $(6, 8), (6, -12)$   
 Endpoints of Conjugate Axis:  $(16, -2)$   
 $(-4, -2)$

$$\frac{(y+2)^2}{100} - \frac{(x-6)^2}{100} = 1$$

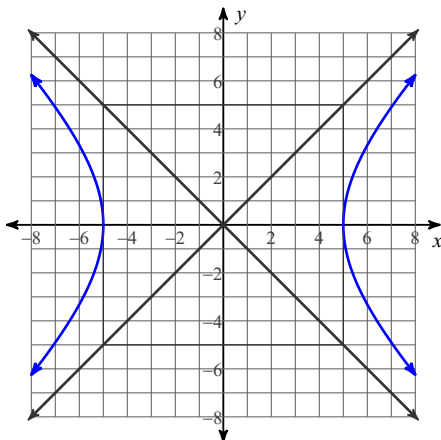
- 7) Vertices:  $(10, 10), (-8, 10)$   
 Foci:  $(1 + \sqrt{97}, 10), (1 - \sqrt{97}, 10)$

$$\frac{(x-1)^2}{81} - \frac{(y-10)^2}{16} = 1$$

- 8) Vertices:  $(-9, 17), (-9, 1)$   
 Foci:  $(-9, 9 + \sqrt{185}), (-9, 9 - \sqrt{185})$

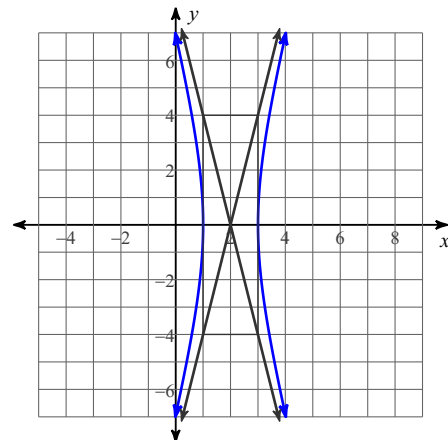
$$\frac{(y-9)^2}{64} - \frac{(x+9)^2}{121} = 1$$

9)



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

10)



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