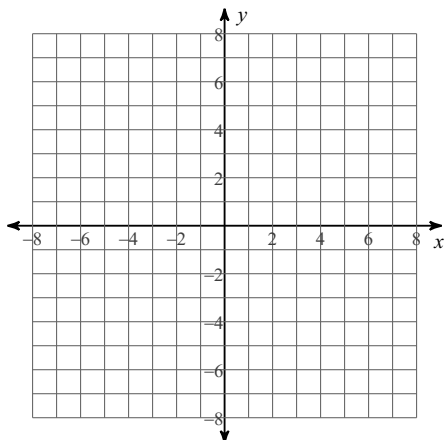


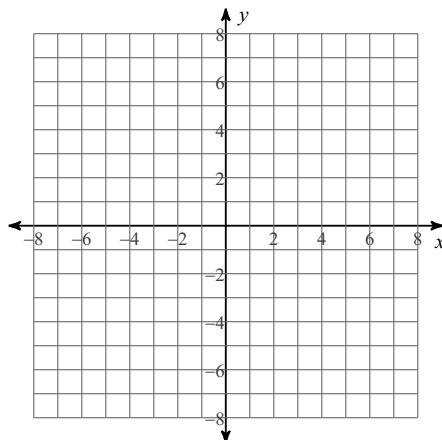
# Characteristics of a Hyperbola

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

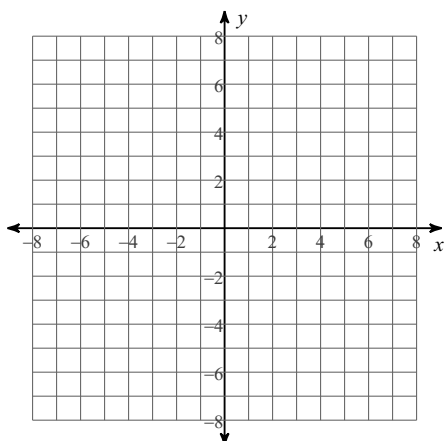
1)  $\frac{x^2}{10} - \frac{y^2}{20} = 1$



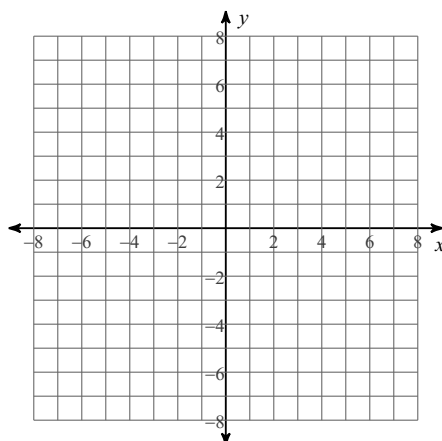
2)  $\frac{(x+1)^2}{16} - \frac{(y+1)^2}{4} = 1$



3)  $\frac{y^2}{25} - \frac{(x-2)^2}{9} = 1$



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



**Identify the vertices and foci of each.**

5)  $-x^2 + 9y^2 - 2x - 18y - 73 = 0$

6)  $x^2 - y^2 + 8x - 8y - 81 = 0$

7)  $4x^2 - y^2 - 16x + 6y - 57 = 0$

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

8) Vertices:  $(0, 6), (0, -6)$   
Endpoints of Conjugate Axis:  $(8, 0)$   
 $(-8, 0)$

9) Vertices:  $(3, 7), (3, -3)$   
Endpoints of Conjugate Axis:  $(11, 2)$   
 $(-5, 2)$

10) Vertices:  $(10, -8), (-6, -8)$   
Foci:  $(12, -8), (-8, -8)$

11) Vertices:  $(10, -9), (-4, -9)$   
Foci:  $(3 + \sqrt{130}, -9), (3 - \sqrt{130}, -9)$

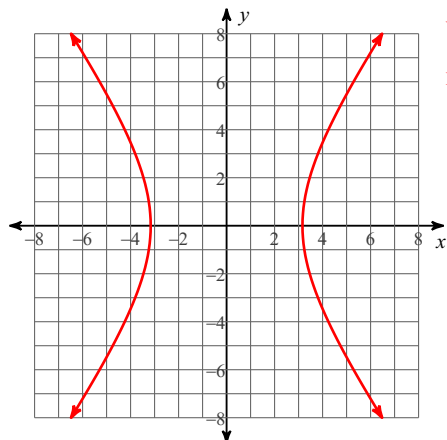
12) Vertices:  $(-1, 10), (-19, 10)$   
Conjugate Axis is 4 units long

13) Vertices:  $(9, 9), (-11, 9)$   
Conjugate Axis is 24 units long

# Characteristics of a Hyperbola

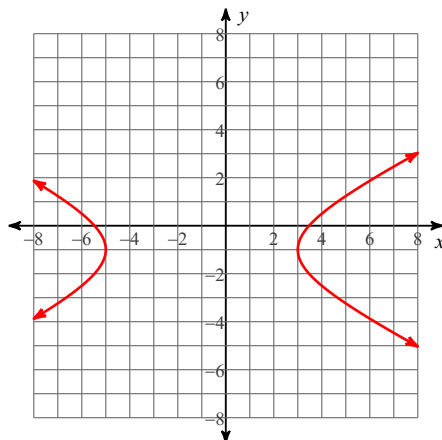
Identify the vertices and foci of each. Then sketch the graph.

1)  $\frac{x^2}{10} - \frac{y^2}{20} = 1$



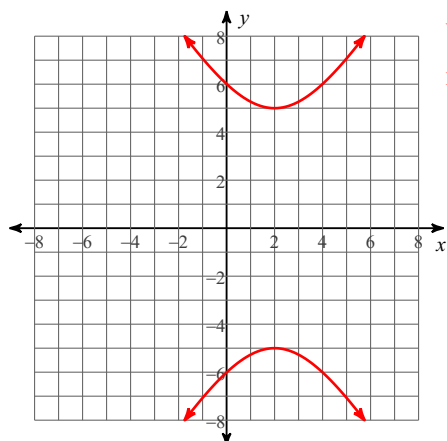
Vertices:  $(\sqrt{10}, 0)$   
 $(-\sqrt{10}, 0)$   
 Foci:  $(\sqrt{30}, 0)$   
 $(-\sqrt{30}, 0)$

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



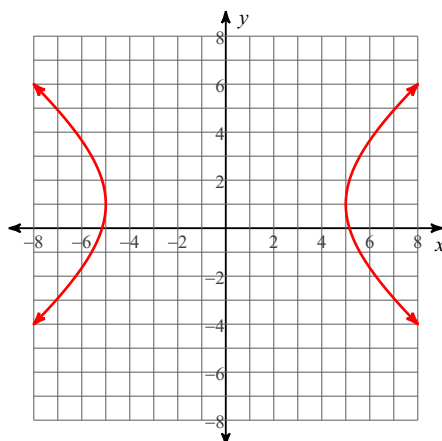
Vertices:  $(3, -1)$   
 $(-5, -1)$   
 Foci:  $(-1 + 2\sqrt{5}, -1)$   
 $(-1 - 2\sqrt{5}, -1)$

3)  $\frac{y^2}{25} - \frac{(x-2)^2}{9} = 1$



Vertices:  $(2, 5)$   
 $(2, -5)$   
 Foci:  $(2, \sqrt{34})$   
 $(2, -\sqrt{34})$

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



Vertices:  $(5, 1)$   
 $(-5, 1)$   
 Foci:  $(\sqrt{41}, 1)$   
 $(-\sqrt{41}, 1)$

**Identify the vertices and foci of each.**

5)  $-x^2 + 9y^2 - 2x - 18y - 73 = 0$

Vertices:  $(-1, 4), (-1, -2)$

Foci:  $(-1, 1 + 3\sqrt{10}), (-1, 1 - 3\sqrt{10})$

6)  $x^2 - y^2 + 8x - 8y - 81 = 0$

Vertices:  $(5, -4), (-13, -4)$

Foci:  $(-4 + 9\sqrt{2}, -4), (-4 - 9\sqrt{2}, -4)$

7)  $4x^2 - y^2 - 16x + 6y - 57 = 0$

Vertices:  $(6, 3), (-2, 3)$

Foci:  $(2 + 4\sqrt{5}, 3), (2 - 4\sqrt{5}, 3)$

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

8) Vertices:  $(0, 6), (0, -6)$

Endpoints of Conjugate Axis:  $(8, 0)$   
 $(-8, 0)$

$$\frac{y^2}{36} - \frac{x^2}{64} = 1$$

9) Vertices:  $(3, 7), (3, -3)$

Endpoints of Conjugate Axis:  $(11, 2)$   
 $(-5, 2)$

$$\frac{(y-2)^2}{25} - \frac{(x-3)^2}{64} = 1$$

10) Vertices:  $(10, -8), (-6, -8)$

Foci:  $(12, -8), (-8, -8)$

$$\frac{(x-2)^2}{64} - \frac{(y+8)^2}{36} = 1$$

11) Vertices:  $(10, -9), (-4, -9)$

Foci:  $(3 + \sqrt{130}, -9), (3 - \sqrt{130}, -9)$

$$\frac{(x-3)^2}{49} - \frac{(y+9)^2}{81} = 1$$

12) Vertices:  $(-1, 10), (-19, 10)$

Conjugate Axis is 4 units long

$$\frac{(x+10)^2}{81} - \frac{(y-10)^2}{4} = 1$$

13) Vertices:  $(9, 9), (-11, 9)$

Conjugate Axis is 24 units long

$$\frac{(x+1)^2}{100} - \frac{(y-9)^2}{144} = 1$$