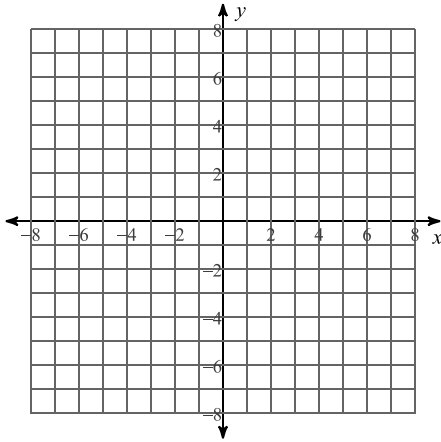


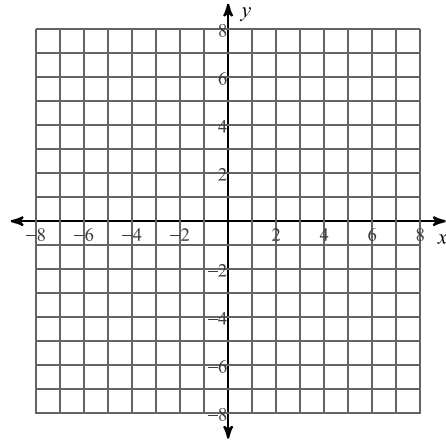
Conic Sections- Hyperbolas Notes Day 2

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

1) $25x^2 - 16y^2 + 50x - 375 = 0$

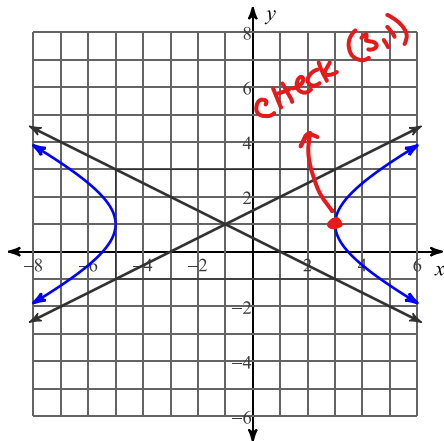


2) $-16x^2 + y^2 + 128x - 2y - 271 = 0$



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

3)



$c (-1, 1)$ y is negative

L/R 4

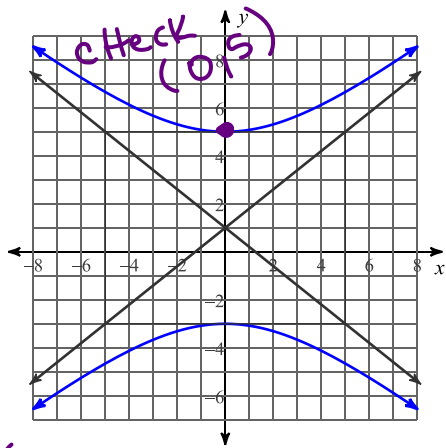
u/d 2

$(b = a^2)$

$(4 = b^2)$

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

4)



Center (0, 1)

x is negative

up/down 4 L/R 5

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

6) Foci: (11, -4), (-15, -4)

Endpoints of Conjugate Axis: (-2, 8), (-2, -16)

center (-2, -4)

focal length (c) 13

$$c^2 = 169$$

$$b = 12 \rightarrow b^2 = 144$$

$$c^2 = a^2 + b^2 \rightarrow 169 = a^2 + 144$$

$$a^2 = 25 \rightarrow a = 5$$

$$\frac{(x+2)^2}{25} - \frac{(y+4)^2}{144} = 1$$

(direction of opening)

5) Center at (-1, -9)

Transverse axis is vertical and 20 units long
Conjugate axis is 8 units long

so $y > 0$

axis is length of rectangle

major

minor

$$\frac{20}{2} = 10$$

up/down

$$\frac{8}{2} = 4$$

L/R

$$\frac{(y+9)^2}{100} - \frac{(x+1)^2}{16} = 1$$

7) Vertices: (7, 5), (7, -19)

Foci: (7, 6), (7, -20)

center (7, -7)

transverse along y

$$c = 13$$

$$a = 12$$

$$c^2 = a^2 + b^2$$

$$169 = 144 + b^2$$

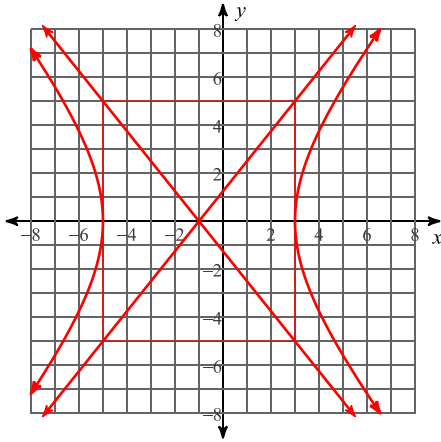
$$25 = b^2 \rightarrow b = 5$$

$$-\frac{(x-7)^2}{25} + \frac{(y+7)^2}{144} = 1$$

Conic Sections- Hyperbolas Notes Day 2

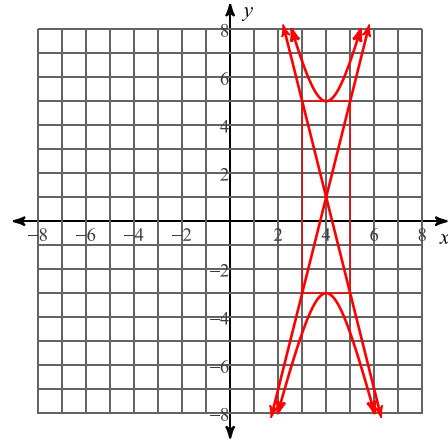
Identify the vertices, foci, and asymptotes of each. Then sketch the graph.

1) $25x^2 - 16y^2 + 50x - 375 = 0$



Vertices: $(3, 0)$
 $(-5, 0)$
 Foci: $(-1 + \sqrt{41}, 0)$
 $(-1 - \sqrt{41}, 0)$
 Asym.: $y = \frac{5}{4}x + \frac{5}{4}$
 $y = -\frac{5}{4}x - \frac{5}{4}$

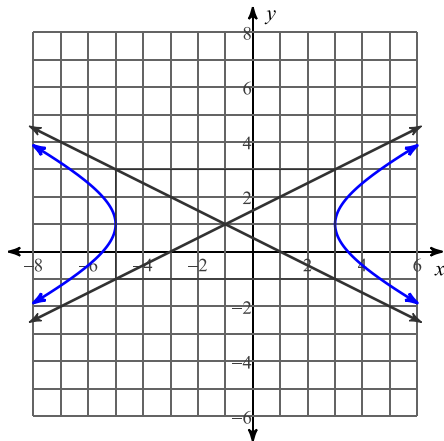
2) $-16x^2 + y^2 + 128x - 2y - 271 = 0$



Vertices: $(4, 5)$
 $(4, -3)$
 Foci: $(4, 1 + \sqrt{17})$
 $(4, 1 - \sqrt{17})$
 Asym.: $y = 4x - 15$
 $y = -4x + 17$

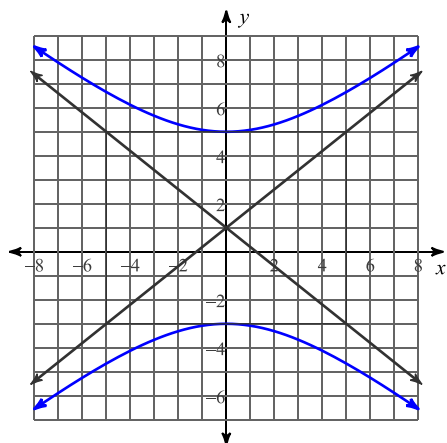
Use the information provided to write the standard form equation of each hyperbola.

3)



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

4)



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

5) Center at $(-1, -9)$

Transverse axis is vertical and 20 units long

Conjugate axis is 8 units long

$$\frac{(y+9)^2}{100} - \frac{(x+1)^2}{16} = 1$$

6) Foci: $(11, -4)$, $(-15, -4)$ Endpoints of Conjugate Axis: $(-2, 8)$
 $(-2, -16)$

$$\frac{(x+2)^2}{25} - \frac{(y+4)^2}{144} = 1$$

7) Vertices: $(7, 5)$, $(7, -19)$ Foci: $(7, 6)$, $(7, -20)$

$$\frac{(y+7)^2}{144} - \frac{(x-7)^2}{25} = 1$$