

1. Find the center and foci of the hyperbola:  
 $3x^2 - 4y^2 - 6x - 16y + 7 = 0$

1. \_\_\_\_\_

2. Determine the equation for the hyperbola with center at  $(0, -2)$ , one vertex at  $(0, -4)$  and one focus at  $(0, 2)$ .

2. \_\_\_\_\_

3. Determine the equation for the hyperbola with ends of the conjugate axis at  $(6, 3)$  and  $(-4, 3)$ , and a vertex at  $(1, 10)$ .

3. \_\_\_\_\_

4. Find the vertices of the hyperbola:  
 $2y^2 - x^2 + 2x - 3 = 0$ .

4. \_\_\_\_\_

5. Determine the equation for the hyperbola with vertices at  $(0, -1)$  and  $(4, -1)$ , and foci at  $(-2, -1)$  and  $(6, -1)$ .

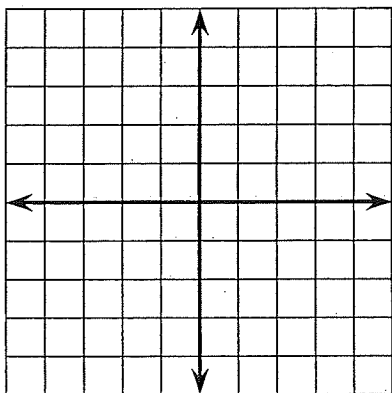
5. \_\_\_\_\_

6. Determine the equation for the hyperbola with vertices at (6,3) and (-2,3) and with asymptotes

$$y = \frac{3}{4}x + \frac{3}{2} \text{ and } y = -\frac{3}{4}x + \frac{9}{2}.$$

7. Find the vertices, foci, equation of asymptotes of the hyperbola and sketch its graph.

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



6. \_\_\_\_\_

7. \_\_\_\_\_

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### Answers

1. Center: (1, -2)

$$\text{Foci: } \left(1, -2 \pm \sqrt{\frac{35}{3}}\right)$$

2.  $\frac{(y+2)^2}{4} - \frac{x^2}{12} = 1$

3.  $\frac{(y-3)^2}{49} - \frac{(x-1)^2}{25} = 1$

4. Vertices: (1,1) and (1,-1)

5.  $\frac{(x-2)^2}{4} - \frac{(y+1)^2}{12} = 1$

6.  $\frac{(x-2)^2}{16} - \frac{(y-3)^2}{9} = 1$

7. Center: (-1, -2)

Vertices:

(-1, 0) and (-1, -4)

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

Asymptotes:

$y = \frac{1}{2}x - 1.5$  and

$y = -\frac{1}{2}x - 2.5$