

1. Write the equation of an ellipse with center  $(-2, -1)$ , a horizontal major axis of length 10 and a minor axis of length 5.

2. Write an equation of the ellipse with a vertex at  $(0,7)$  and a co-vertex at  $(-3, 0)$

3. Write the equation of the ellipse in standard form. Then identify the vertices, co-vertices, and foci point of the ellipse.

$144x^2 + 36y^2 = 144$       Standard form: \_\_\_\_\_ Vertices: \_\_\_\_\_  
Co-vertices: \_\_\_\_\_ Foci: \_\_\_\_\_

4. Write the equation of the ellipse in standard form  $3x^2 + y^2 - 48x - 4y + 184 = 0$ .

5. Write an equation of the hyperbola with foci at  $(0, -3)$  and  $(0, 3)$  and vertices at  $(0, -2)$  and  $(0, 2)$ .

6. Write the equation of the hyperbola in standard form  $3x^2 - 4y^2 - 30x - 8y + 59 = 0$

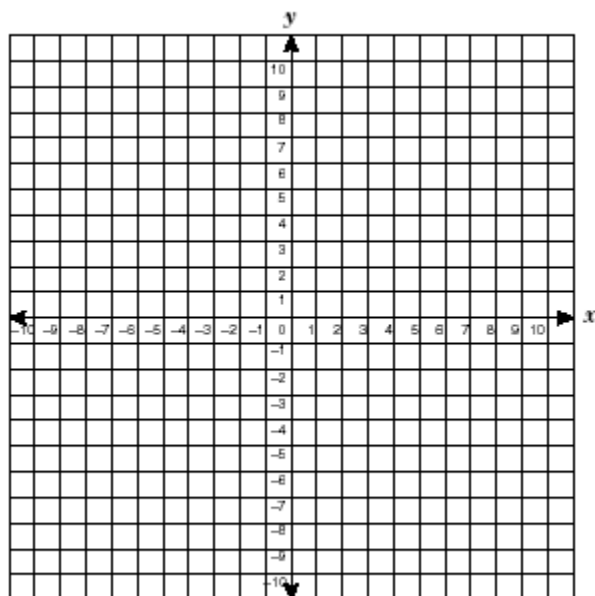
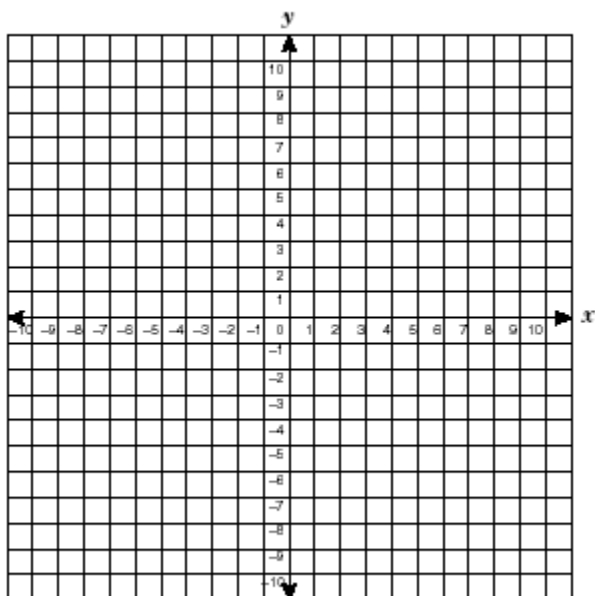
7. Write the equation of the hyperbola in standard form. Then identify the vertices, asymptote equations, and foci point of the hyperbola.  $y^2 - 16x^2 - 64 = 0$       Standard form: \_\_\_\_\_ Vertices: \_\_\_\_\_

Asymptotes @ : \_\_\_\_\_ Foci: \_\_\_\_\_

Graph the equations. Label and sketch any asymptotes and foci points.

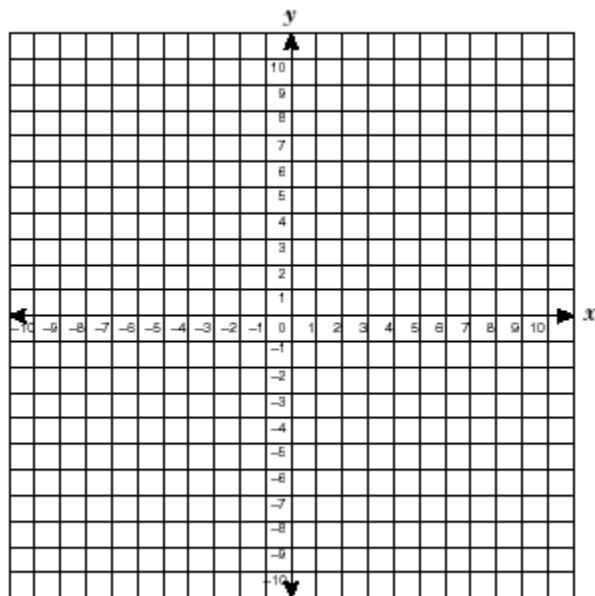
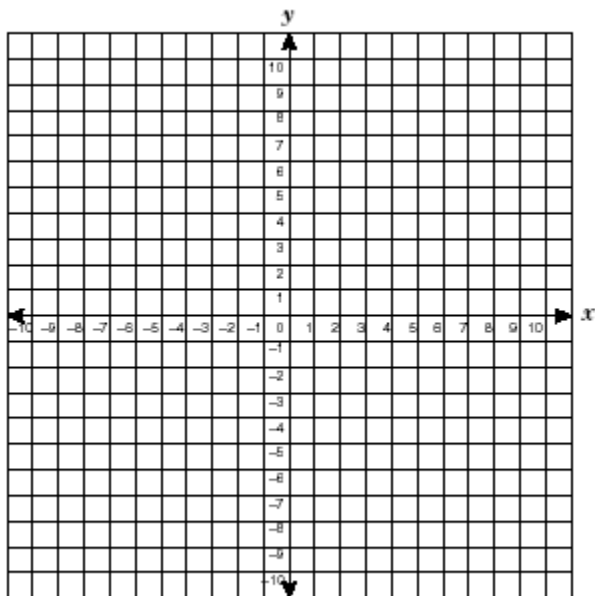
8.  $\frac{(x-3)^2}{9} - \frac{(y+5)^2}{49} = 1$

9.  $\frac{(y+5)^2}{1} - \frac{(x-1)^2}{9} = 1$



10.  $\frac{x^2}{16} + \frac{y^2}{36} = 1$

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



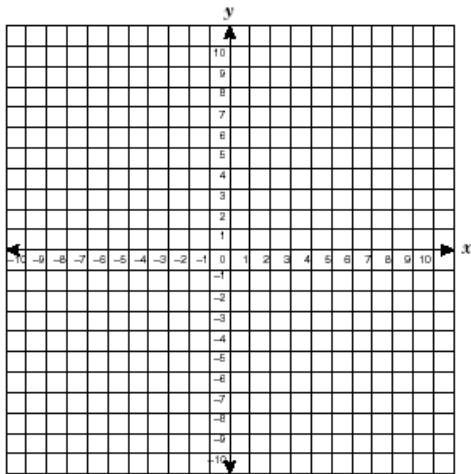
12. An elliptical pool is 12 feet long and 8 feet wide. Write an equation for the swimming pool. (Assume that the major axis of the pool is vertical and the center is at the origin.)

13. A space probe flies by a planet in an hyperbolic orbit. It reaches the vertex of its orbit at  $(5, 0)$  and then travels along a path that gets closer and closer to the line  $y = \frac{2}{5}x$ . Write an equation that describes the path of the space probe if the center of its hyperbolic orbit is at  $(0, 0)$ .

14. Write an equation of the circle if the endpoints of a diameter are  $(5, -7)$  and  $(-2, 4)$ .

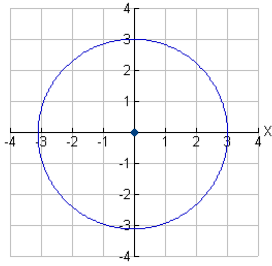
15. Write the equation of the circle with center at  $(-6, 5)$ , tangent to the x-axis.

16. Write the equation of the circle in standard form. Then graph.  $x^2 + y^2 - 4x - 2y - 4 = 0$



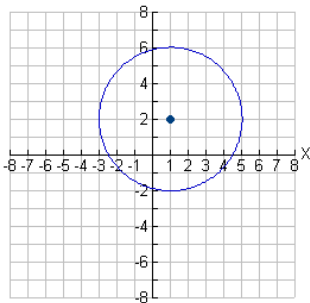
17. Find the equation of the tangent line to the circle  $x^2 + y^2 = 34$  at the point  $(-5, 3)$ .

18. Write the standard form equation of the circle whose graph is shown below.



19. A cellular phone tower services a 15 mile radius. On a hiking trip, you are 9 miles east and 11 miles north of the cell tower. Are you in the region served by the tower? Explain why or why not.

20. Write the standard form equation for the circle whose graph is shown at the right. List 6 points that lie on this circle.



21. Write an equation of the ellipse with foci (3,5) and (3, -1) and vertices at (3,6) and (3, -2).

22. Write an equation of a hyperbola with center at (2, -3), a focus at (8, -3) and one vertex at (6,-3).