

10-1 Introduction to Conic Sections

1. A delivery area of a pizza parlor extends to the locations $(6, 2)$ and $(6, -8)$. Write an equation for the delivery area of the pizza parlor if a line between the locations represents a diameter of the delivery area.

Identify and describe each conic section.

2. $\frac{(x+1)^2}{36} + \frac{(y+3)^2}{36} = 1$

3. $4x^2 + 9y^2 = 36$

4. $x = -y^2 - 4$

5. $\frac{x^2}{25} - \frac{y^2}{36} = 1$

10-2 Circles

Write the equation of each circle.

6. center
- $(-2, 5)$
- and radius
- $r = 4$

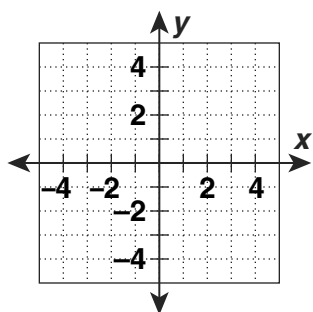
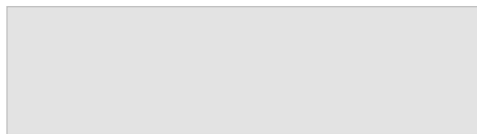
7. center
- $(3, -2)$
- and containing the point
- $(11, -2)$

8. Write the equation of the line that is tangent to
- $x^2 + y^2 = 25$
- at
- $(-3, 4)$
- .

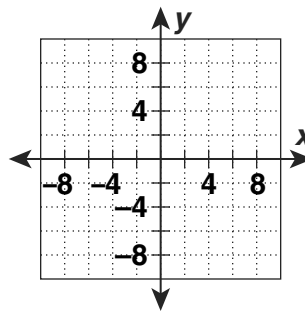
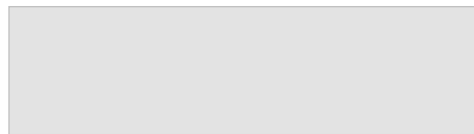
10-3 Ellipses

Find the center, vertices, co-vertices, and foci of each ellipse. Then graph.

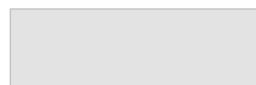
9. $\frac{x^2}{25} + \frac{y^2}{9} = 1$



10. $25(x - 1)^2 + 9(y - 1)^2 = 225$



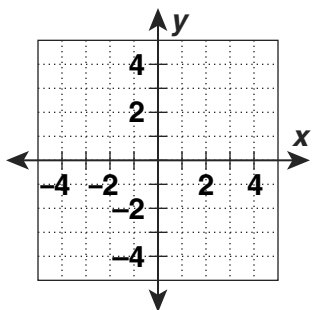
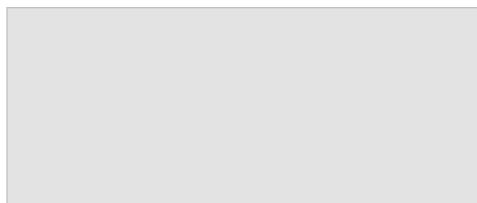
11. A child models a semi-elliptical bridge for a science fair project. The bridge is 12 inches wide and 4 inches high at its highest point. Write an equation for a cross section of the bridge.



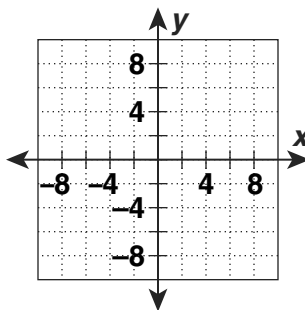
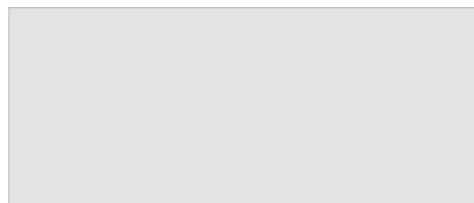
10-4 Hyperbolas

Find the center, vertices, co-vertices, foci, and asymptotes for each hyperbola. Then graph.

12. $\frac{x^2}{4} - \frac{y^2}{9} = 1$



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



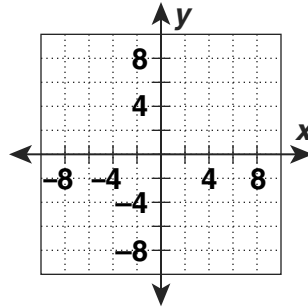
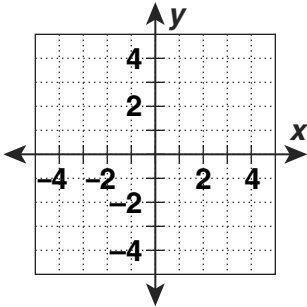
14. Write the equation of a hyperbola with vertices $(-2, 0)$ and $(-2, 6)$ and co-vertices $(-3, 3)$ and $(-1, 3)$.

10-5 Parabolas

Find the vertex, value of p , axis of symmetry, focus, and directrix for each parabola. Then graph.

15. $x = -\frac{1}{4}y^2$

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



17. Write an equation of the parabola with focus $(0, -3)$ and directrix $x = 4$.

18. A fabricator fabricates a taillight for an automobile. If the depth of the parabolic taillight is 4 inches and 5 inches in diameter, what is the distance d the bulb should be from the vertex in order for the beam of light to shine straight ahead?

10-6 Identifying Conic Sections

Identify the conic section that each equation represents.

19. $(x - 5)^2 + (y + 3)^2 = 16$

20. $\frac{x^2}{16} - \frac{y^2}{4} = 1$

21. $9x^2 - 36x + 16y^2 - 64y - 44 = 0$ 22. $2x = y^2 + 4y + 12$

23. $(x - 1)^2 = (y - 2)$

24. $9x^2 - 18x + 4y^2 - 16y - 43 = 0$

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

26. $4x^2 + 9y^2 = 36$

Write each equation in the form $Ax^2 + Bxy + Cy^2 + Dx + Ey + F = 0$.

27. $(x + 4)^2 + (y - 1)^2 = 2$

28. $\frac{(x - 2)^2}{9} + \frac{(y + 3)^2}{4} = 1$

Find the standard form of each equation by completing the square. Then identify the conic.

29. $3y^2 + 24y - 2x^2 + 12x + 24 = 0$ 30. $9x^2 + 18x + 4y^2 - 8y - 23 = 0$

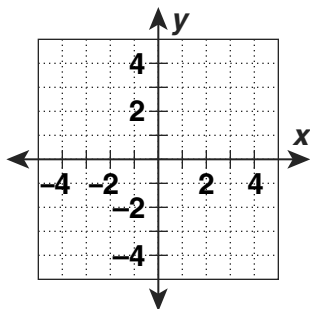
31. $2x = y^2 + 4y + 12$

32. $x^2 + 6x + y^2 - 4y - 3 = 0$

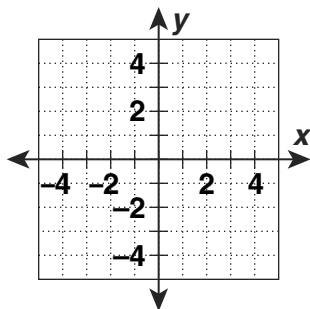
10-7 Solving Nonlinear Systems

Solve each system of equations by graphing.

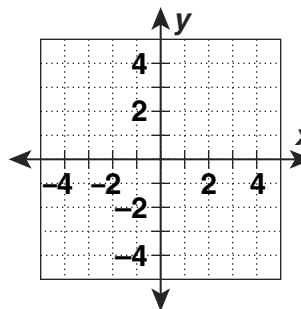
33.
$$\begin{cases} x^2 + y^2 = 9 \\ 2x^2 + 3y^2 = 18 \end{cases}$$



34.
$$\begin{cases} y^2 = x + 3 \\ 2y = x + 4 \end{cases}$$



35.
$$\begin{cases} x^2 + 2y^2 = 16 \\ 4x^2 + y^2 = 4 \end{cases}$$



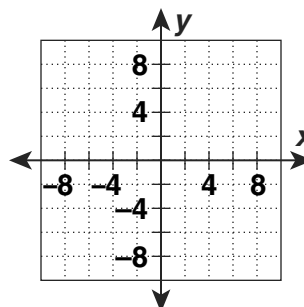
Solve each system of equations by using the substitution or elimination method.

36.
$$\begin{cases} x^2 + y^2 = 4 \\ 2x^2 - y^2 = 8 \end{cases}$$

37.
$$\begin{cases} 2x^2 + 2y^2 = 8 \\ 4x^2 - 9y^2 = 36 \end{cases}$$

38.
$$\begin{cases} x^2 + y^2 = 9 \\ 9x^2 + y^2 = 9 \end{cases}$$

39. Two ice-skaters are giving a performance. The paths of the skaters are shown in the graph. During the performance, the lead skater moves in a path that can be modeled by the equation $y = \frac{1}{4}(x - 2)^2 + 1$. The otherskater glides in formation along the equation $x = y^2 + y - 6$. At what point(s) are the skaters in danger of colliding?



40. Find n so that the system
$$\begin{cases} x^2 - y^2 = 16 \\ x + y^2 = n \end{cases}$$
 has exactly 3 solutions.