

Find the midpoint of the line segment with endpoints at the given coordinates.

- $(7, 1), (-5, 9)$
- $\left(\frac{3}{8}, -1\right), \left(-\frac{8}{5}, 2\right)$
- $(-13, 0), (-1, -8)$

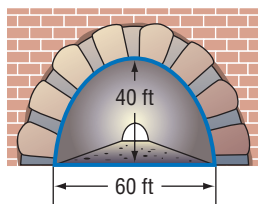
Find the distance between each pair of points with the given coordinates.

- $(-6, 7), (3, 2)$
- $\left(\frac{1}{2}, \frac{5}{2}\right), \left(-\frac{3}{4}, -\frac{11}{4}\right)$
- $(8, -1), (8, -9)$

State whether the graph of each equation is a *parabola*, *circle*, *ellipse*, or *hyperbola*. Then graph the equation.

- $x^2 + 4y^2 = 25$
- $x^2 = 36 - y^2$
- $4x^2 - 26y^2 + 10 = 0$
- $-(y^2 - 24) = x^2 + 10x$
- $\frac{1}{3}x^2 - 4 = y$
- $y = 4x^2 + 1$
- $(x + 4)^2 = 7(y + 5)$
- $25x^2 + 49y^2 = 1225$
- $5x^2 - y^2 = 49$
- $\frac{y^2}{9} - \frac{x^2}{25} = 1$

17. **TUNNELS** The opening of a tunnel is in the shape of a semielliptical arch. The arch is 60 feet wide and 40 feet high. Find the height of the arch 12 feet from the edge of the tunnel.



18. Solve the system of inequalities by graphing.

$$x^2 - y^2 \geq 1$$

$$x^2 + y^2 \leq 16$$

Find the exact solution(s) of each system of equations.

19. $x^2 + y^2 = 100$

$$y = 2 - x$$

20. $x^2 + 2y^2 = 6$

$$x + y = 1$$

21. $x^2 - y^2 - 12x + 12y = 36$

$$x^2 + y^2 - 12x - 12y + 36 = 0$$

FORESTRY For Exercises 22 and 23, use the following information.

A forest ranger at an outpost in the Fishlake National Forest in Utah and another ranger at the primary station both heard an explosion. The outpost and the primary station are 6 kilometers apart.

22. If one ranger heard the explosion 6 seconds before the other, write an equation that describes all the possible locations of the explosion. Place the two ranger stations on the x -axis with the midpoint between the stations at the origin. The transverse axis is horizontal. (*Hint*: The speed of sound is about 0.35 kilometer per second.)
23. Draw a sketch of the possible locations of the explosion. Include the ranger stations in the drawing.

24. **MULTIPLE CHOICE** Which is NOT the equation of a parabola?

A $y = 2x^2 + 4x - 9$

B $3x + 2y^2 + y + 1 = 0$

C $x^2 + 2y^2 + 8y = 8$

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