

Find the distance between the two points. Then find the midpoint of the line segment joining the two points.

1. $(-1, 5), (7, 3)$ $2\sqrt{17}; (3, 4)$ 2. $(4, 2), (8, 8)$ $2\sqrt{13}; (6, 5)$ 3. $(-1, -6), (1, 5)$ $5\sqrt{5}; (0, -\frac{1}{2})$
 4. $(2, -5), (3, 1)$ $\sqrt{37}; (\frac{5}{2}, -2)$ 5. $(-6, -2), (-3, 5)$ 6. $(1, 9), (10, -2)$ $\sqrt{202}; (\frac{11}{2}, \frac{7}{2})$
 $\sqrt{58}; (-\frac{9}{2}, \frac{3}{2})$

Graph the equation. 7–15. See margin.

7. $y^2 - 24x = 0$ 8. $x^2 + y^2 = 16$ 9. $64y^2 - x^2 = 64$
 10. $18x^2 + 2y^2 = 18$ 11. $(x - 6)^2 + (y + 1)^2 = 36$ 12. $(x + 4)^2 = 6(y - 2)$
 13. $\frac{(x + 4)^2}{9} - \frac{(y - 7)^2}{49} = 1$ 14. $\frac{(x - 8)^2}{81} + \frac{(y - 2)^2}{100} = 1$ 15. $\frac{(y - 5)^2}{9} - (x + 3)^2 = 1$

Write the standard form of the equation of the conic section with the given characteristics.

16. Parabola with vertex at $(0, 0)$ and directrix at $x = -6$ $y^2 = 24x$
 17. Parabola with vertex at $(-2, -1)$ and focus at $(-2, 5)$ $(x + 2)^2 = 24(y + 1)$
 18. Circle with center at $(0, 0)$ and passing through $(-5, 2)$ $x^2 + y^2 = 29$
 19. Circle with center at $(1, -4)$ and radius 6 $(x - 1)^2 + (y + 4)^2 = 36$
 20. Ellipse with center at $(0, 0)$, vertex at $(0, 6)$, and co-vertex at $(-3, 0)$
 21. Ellipse with vertices at $(-1, 4)$ and $(7, 4)$ and foci at $(1, 4)$ and $(5, 4)$ $\frac{(x - 3)^2}{16} + \frac{(y - 4)^2}{12} = 1$
 22. Hyperbola with vertices at $(0, -6)$ and $(0, 6)$ and foci at $(0, -9)$ and $(0, 9)$
 23. Hyperbola with vertex at $(2, -5)$, focus at $(-1, -5)$, and center at $(5, -5)$ $\frac{(x - 5)^2}{9} - \frac{(y + 5)^2}{27} = 1$
 20. $\frac{x^2}{9} + \frac{y^2}{36} = 1$
 22. $\frac{y^2}{36} - \frac{x^2}{45} = 1$

Classify the conic section and write its equation in standard form. 24–29. See margin.

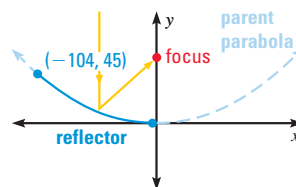
24. $x^2 + 4y^2 - 6x - 16y + 21 = 0$ 25. $x^2 + y^2 + 8x + 12y + 3 = 0$
 26. $4x^2 - 9y^2 - 40x + 64 = 0$ 27. $y^2 - 16y - 12x + 40 = 0$
 28. $25x^2 + 4y^2 + 50x - 24y - 39 = 0$ 29. $y^2 - 16x^2 + 14y + 64x - 31 = 0$

Solve the system.

30. $4x^2 + y^2 = 16$ 31. $x^2 + 4y^2 - 8y = 4$ 32. $y^2 - x^2 + 2x - 5 = 0$
 $x + y = 2$ $(-\frac{6}{5}, \frac{16}{5}), (2, 0)$ $y^2 - 2y - 8x - 16 = 0$ $x^2 + y^2 - 2x - 3 = 0$
 $(-2, 0), (-2, 2)$ $(1, -2), (1, 2)$

33. **WATER SURFACE** A cylindrical glass of water has a 1.5 inch radius. If the glass is tilted 60° , the water's surface meets the glass in an ellipse with minor axis 3 inches long and major axis 6 inches long. Write equations that model the water's surface with the glass upright and after the glass is tilted. Use the center of the water's surface as the origin. $x^2 + y^2 = 2.25$, $\frac{x^2}{9} + \frac{y^2}{36} = 1$

34. **ASTRONOMY** The Green Bank Telescope in West Virginia has a main reflector whose cross section is a portion of a "parent" parabola. A diagram of the reflector's cross section and the parent parabola is shown. Write an equation that models the parent parabola if its vertex is at $(0, 0)$. What is the distance from the vertex to the focus? $x^2 = \frac{10,816}{45}$; about 60.1 m



Chapter Test 673

Additional Resources

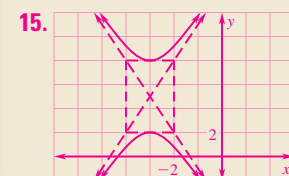
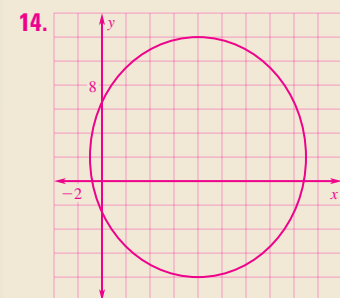
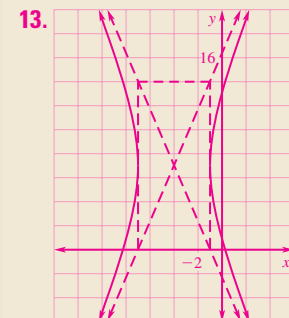
Assessment Book

- Chapter Test, Levels A, B, C, pp. 128–132
- Standardized Chapter Test, pp. 133–134
- SAT/ACT Chapter Test, pp. 135–136
- Alternative Assessment, pp. 137–138

Test Generator CD-ROM

Chapter Test

Easily-readable reduced copies (with answers) of Chapter Test B, the Standardized Chapter Test, and the Alternative Assessment from the Assessment Book can be found on pp. 612E–612F.



24–29. See Additional Answers beginning on p. AA1.

