Name _____ Class _____ Date _____

Extra Practice

Chapter 10

Lesson 10-1

Graph each equation. Identify the conic section and describe the graph and its lines of symmetry. Then find the domain and range.

1. $x^2 + y^2 = 4$ **2.** $x^2 - 16y^2 = 64$ **3.** $4x^2 + 9y^2 = 36$

Lesson 10-2

Write an equation of a parabola with its vertex at the origin and the given focus.

4. focus at (0, 3) **5.** focus at (0, −5) **6.** focus at $\left(\frac{3}{2}, 0\right)$

Write an equation of a parabola with its vertex at the origin and the given directrix.

7. directrix at $x = 4$ **8.** directrix at $y = \frac{1}{2}$

Identify the vertex, focus, and the directrix of the parabola with the given equation. Then sketch the graph of the parabola.

9. $y = 4x^2$ **10.** $x^2 = 6y$ **11.** $x^2 + 4y = 0$

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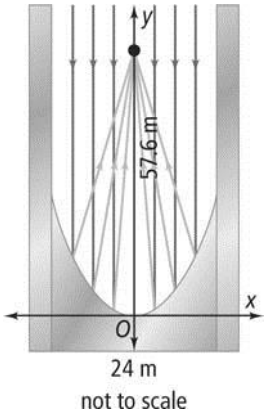
Extra Practice (continued)

Chapter 10

12. The main mirror in the Hubble space telescope is parabolic. Its cross section is shown at the right. The focus of the parabola is 57.6 m from the vertex. Use this information and the diagram to find the equation of the parabola.



Lesson 10-3

Write an equation of a circle with the given center and radius. Check your answers.

13. center (0, 0); radius 8

14. center (−4, −6); radius 2

15. center (−5, 1); radius 3

For each equation, find the center and radius of the circle.

16. $(x + 1)^2 + (y - 3)^2 = 4$

17. $(x + 6)^2 + (y + 9)^2 = 144$

18. A tanker truck carrying hazardous chemicals overturned on a highway, possibly spilling some of its cargo. Everyone within a 1.5-mile radius of the spill must be evacuated. The map that safety workers are using shows the spill site at coordinates (4.5, 7). Each unit of measurement is 1 mi. Write an equation that describes the boundary of the evacvuation region.

Lesson 10-4

Write an equation of an ellipse in standard form with center at the origin and with the given vertex and co-vertex. (Note that the vertex is listed first and the co-vertex is listed second.)

19. (4, 0), (0, 3)

20. (0, 5), (2, 0)

21. (8, 0), (0, −4)

Find the foci for each equation of an ellipse. Then graph the ellipse.

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

23. $\frac{x^2}{36} + \frac{y^2}{4} = 1$

24. $\frac{x^2}{81} + \frac{y^2}{64} = 1$

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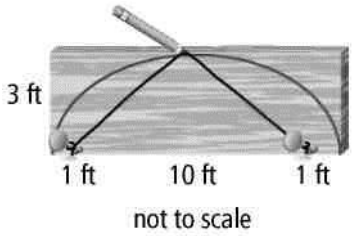
Extra Practice (continued)

Chapter 10

25. A carpenter wants to cut a template for an elliptical window with 2 major axes of 10 ft. and a minor axis of 6 ft. He has a 10-ft by 3-ft rectangular piece of plywood. The carpenter plans to use a string to draw the top half of the ellipse, using a nail at each focus. The nails are along the bottom edge, 1 ft from each end.



a. What length of string should the carpenter use to sketch the curve?

b. If the x-axis is the bottom edge of the board, and (0, 0) is the midpoint of that edge, what are the coordinates of the nails?

c. Find the equation of the ellipse.

Lesson 10-5

Find the equation of a hyperbola with the given values, foci, or vertices. Assume that the transverse axis is horizontal.

26. $a = 2, b = 7$ **27.** $a = 5, b = 6$ **28.** $a = -4, b = 9$

Graph each equation.

29. $4x^2 - 25y^2 = 100$ **30.** $81x^2 - 16y^2 = 1296$ **31.** $y^2 - 4x^2 = 36$

Name _____ Class _____ Date _____

Extra Practice (continued)

Chapter 10

Lesson 10-6

Identify the conic section represented by each equation. If it is a parabola, give the vertex. If it is a circle, give the center and radius. If it is an ellipse or a hyperbola, give the center and foci. Sketch the graph.

32. $(x+1)^2 + (y-2)^2 = 7$ **33.** $\frac{x^2}{73} - \frac{y^2}{19} = 1$ **34.** $x + y^2 - 3y + 4 = 0$

35. Some long-range navigation systems use hyperbolas to determine a ship's position. Suppose the system imposes coordinates so that the location of a ship is in the first quadrant. A ship is located at the intersection of the hyperbolas with equations $9x^2 - 4y^2 = 36$ and $16y^2 - x^2 = 25$. Find the coordinates of the ship to the nearest hundredth of a unit.

36. An engineer determines that the shape of a mirror surface in a motion sensor can be described by the equation $9x^2 - 25y^2 - 12x + 20y = 26$. Identify the conic section that represents the shape of the mirror.