distance from vertex to focus pt

Exercises

= Step-by-Step Solutions begin o

For each equation, identify the vertex, focus, axis of symmetry, and directrix. Then graph the parabola. (Example 1)

1. $(x-3)^2 = 12(y-7)$
2. $(x+1)^2 = -12(y-6)$
3. $(y-4)^2 = 20(x+2)$
4. $-1(x+7) = (y+5)^2$
5. $(x+8)^2 = 8(y-3)$
6. $-40(x+4) = (y-9)^2$
7. $(y+5)^2 = 24(x-1)$
8. $2(y+12) = (x-6)^2$
9. $-4(y+2) = (x+8)^2$
10. $10(x+11) = (y+3)^2$

11. **SKATEBOARDING** A group of high school students designing a half-pipe have decided that the ramps, or transitions, could be obtained by splitting a parabola in half. A parabolic cross section of the ramps can be modeled by $x^2 = 8(y-2)$, where the values of x and y are measured in feet. Where is the focus of the parabola in relation to the ground if the ground represents the directrix? (Example 2)

12. **COMMUNICATION** The cross section of a satellite television dish has a parabolic shape that focuses the satellite signals onto a receiver located at the focus of the parabola. The parabolic cross section can be modeled by $(x-6)^2 = 12(y-10)$, where the values of x and y are measured in inches. Where is the receiver located in relation to this particular cross section? (Example 2)

13. **BOATING** As a speed boat glides through the water, it creates a wake in the shape of a parabola. The vertex of this parabola meets with the stern of the boat. A swimmer on a wakeboard, attached by a piece of rope, is being pulled by the boat. When he is directly behind the boat, he is positioned at the focus of the parabola. The parabola formed by the wake can be modeled using $y^2 - 180x + 10y + 565 = 0$, where x an
in feet. (Example

Write each equation in standard form. Identify the focus, axis of symmetry, and directrix. Then graph t parabola. (Example 3)

15. $x^2 - 17 = 8y + 39$
16. $y^2 + 33 = -8x -$
17. $3x^2 + 72 = -72y$
18. $-12y + 10 = x^2 -$
19. $60x - 80 = 3y^2 + 100$
20. $-33 = x^2 - 12y -$
21. $-72 = 2y^2 - 16y - 20x$
22. $y^2 + 21 = -20x -$
23. $x^2 - 18y + 12x = 126$
24. $-34 = 2x^2 + 20x +$

25. **LIGHTING** Stadium lights at an athletic field need to reflect light at maximum intensity. The bulb should be placed at the focal point of the parabolic globe surrounding it. If a globe is given by $x^2 = 36y$, where x and y are in inches, how far from the shell of the globe should the bulb be placed for maximum light? (Example

Write an equation for and graph a parabola with the given focus F and vertex V. (Example 4)

26. $F(-9, -7)$, $V(-9, -4)$
27. $F(2, -1)$, $V(-4, -1)$
28. $F(-3, -2)$, $V(1, -2)$
29. $F(-3, 4)$, $V(-3, 2)$
30. $F(-2, -4)$, $V(-2, -5)$
31. $F(-1, 4)$, $V(7, 4)$
32. $F(14, -8)$, $V(7, -8)$
33. $F(1, 3)$, $V(1, 6)$
34. $F(-4, 9)$, $V(-2, 9)$
35. $F(8, -3)$, $V(8, -7)$

Write an equation for and graph each parabola with focus f and the given characteristics. (Example 4)

36. $F(3, 3)$; opens up; contains
37. $F(1, 2)$;