Concepts Review

1. If whenever (x, y) is on a graph, $(-x, y)$ is also on the graph, then the graph is symmetric with respect to the _____.

2. If $(-4, 2)$ is on a graph that is symmetric with respect to the origin, then _____ is also on the graph.

3. The graph of $y = (x + 2)(x - 1)(x - 4)$ has y-interce _____ and x-intercepts _____.

4. The graph of $y = ax^2 + bx + c$ is a _____ if $a = 0$ anc _____ if $a \neq 0$.

Problem Set 0.4

In Problems 1–30, plot the graph of each equation. Begin by checking for symmetries and be sure to find all x- and y-intercepts.

1. $y = -x^2 + 1$
2. $x = -y^2 + 1$
3. $x = -4y^2 - 1$
4. $y = 4x^2 - 1$
5. $x^2 + y = 0$
6. $y = x^2 - 2x$
7. $7x^2 + 3y = 0$
8. $y = 3x^2 - 2x + 2$
9. $x^2 + y^2 = 4$
10. $3x^2 + 4y^2 = 12$
11. $y = -x^2 - 2x + 2$
12. $4x^2 + 3y^2 = 12$
13. $x^2 - y^2 = 4$
14. $x^2 + (y - 1)^2 = 9$
15. $4(x - 1)^2 + y^2 = 36$
16. $x^2 - 4x + 3y^2 = -2$
17. $x^2 + 9(y + 2)^2 = 36$

GC 18. $x^4 + y^4 = 1$

GC 19. $x^4 + y^4 = 16$

GC 20. $y = x^3 - x$

GC 21. $y = \dfrac{1}{x^2 + 1}$

GC 22. $y = \dfrac{x}{x^2 + 1}$

GC 23. $2x^2 - 4x + 3y^2 + 12y = -2$

GC 24. $4(x - 5)^2 + 9(y + 2)^2 = 36$

GC 25. $y = (x - 1)(x - 2)(x - 3)$

GC 26. $y = x^2(x - 1)(x - 2)$

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

GC 28. $y = x^4(x - 1)^4(x + 1)^4$

GC 29. $|x| + |y| = 1$

GC 30. $|x| + |y| = 4$

GC *In Problems 31–38, plot the graphs of both equations on the same coordinate plane. Find and label the points of intersection of the two graphs (see Example 4).*

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

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

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

34. $y = -2x + 3$
$y = 3x^2 - 3x + 12$

35. $y = x$
$x^2 + y^2 = 4$

36. $y = x - 1$
$2x^2 + 3y^2 = 12$

37. $y - 3x = 1$
$x^2 + 2x + y^2 = 15$

38. $y = 4x + 3$
$x^2 + y^2 = 81$

39. Choose the equation that corresponds to each graph Figure 8.

(a) $y = ax^2$, with $a > 0$
(b) $y = ax^3 + bx^2 + cx + d$, with $a > 0$
(c) $y = ax^3 + bx^2 + cx + d$, with $a < 0$
(d) $y = ax^3$, with $a > 0$

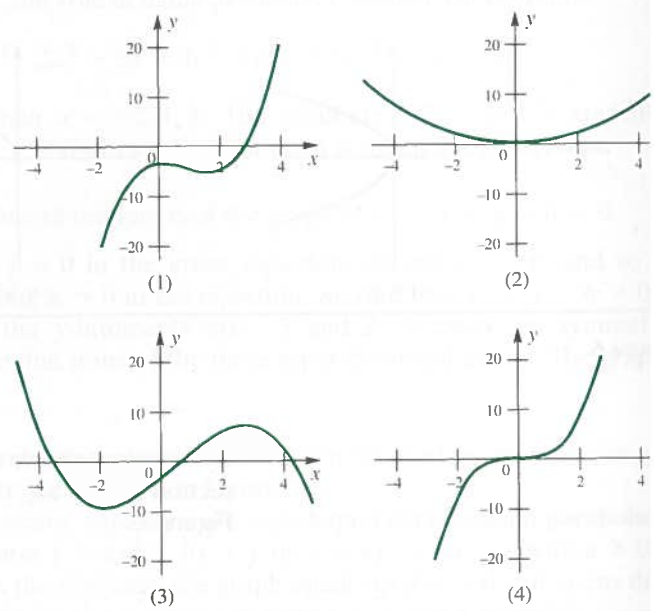

Figure 8

≈ 40. Find the distance between the points on the ci $x^2 + y^2 = 13$ with the x-coordinates -2 and 2. How many s distances are there?

≈ 41. Find the distance between the points on the ci $x^2 + 2x + y^2 - 2y = 20$ with the x-coordinates -2 and 2. H many such distances are there?

Answers to Concepts Review: 1. y-axis 2. $(4, -2)$ 3. 8; $-2, 1, 4$ 4. line; parabola