**EXAMPLE 4**
on p. 339
for Exs. 24–27

24. ★ **MULTIPLE REASONING** The graph of a polynomial function is shown. What is true about the function's degree and leading coefficient?

(A) The degree is odd and the leading coefficient is positive.

(B) The degree is odd and the leading coefficient is negative.

(C) The degree is even and the leading coefficient is positive.

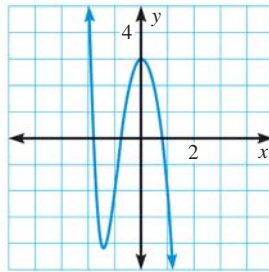(D) The degree is even and the leading coefficient is negative.
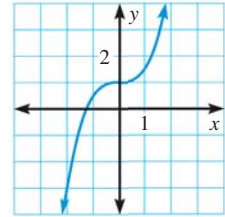
USING END BEHAVIOR *Describe* the degree and leading coefficient of the polynomial function whose graph is shown.
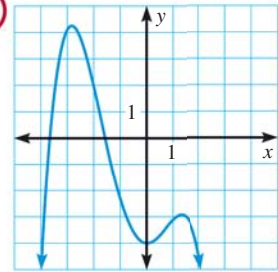
25.
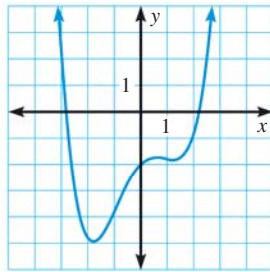
26.

27.

DESCRIBING END BEHAVIOR *Describe* the end behavior of the graph of the polynomial function by completing these statements: $f(x) \to \underline{\ ?\ }$ as $x \to -\infty$ and $f(x) \to \underline{\ ?\ }$ as $x \to +\infty$.

28. $f(x) = 10x^4$

29. $f(x) = -x^6 + 4x^3 - 3x$

30. $f(x) = -2x^3 + 7x - 4$

31. $f(x) = x^7 + 3x^4 - x^2$

32. $f(x) = 3x^{10} - 16x$

33. $f(x) = -6x^5 + 14x^2 + 20$

34. $f(x) = 0.2x^3 - x + 45$

35. $f(x) = 5x^8 + 8x^7$

36. $f(x) = -x^{273} + 500x^{271}$

37. ★ **TAKS REASONING** Write a polynomial function f of degree 5 such that the end behavior of the graph of f is given by $f(x) \to +\infty$ as $x \to -\infty$ and $f(x) \to -\infty$ as $x \to +\infty$. Then graph the function to verify your answer.

EXAMPLE 5
on p. 340
for Exs. 38–50
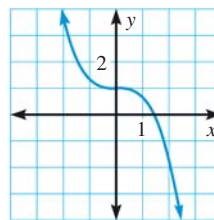
GRAPHING POLYNOMIALS Graph the polynomial function.

38. $f(x) = x^3$

39. $f(x) = -x^4$

40. $f(x) = x^5 + 3$

41. $f(x) = x^4 - 2$

42. $f(x) = -x^3 + 5$

43. $f(x) = x^3 - 5x$

44. $f(x) = -x^4 + 8x$

45. $f(x) = x^5 + x$

46. $f(x) = -x^3 + 3x^2 - 2x + 5$

47. $f(x) = x^5 + x^2 - 4$

48. $f(x) = x^4 - 5x^2 + 6$

49. $f(x) = -x^4 + 3x^3 - x + 1$

50. ★ **MULTIPLE REASONING** Which function is represented by the graph shown?

(A) $f(x) = \frac{1}{3}x^3 + 1$ (B) $f(x) = -\frac{1}{3}x^3 + 1$

(C) $f(x) = \frac{1}{3}x^3 - 1$ (D) $f(x) = -\frac{1}{3}x^3 - 1$

51. **VISUAL THINKING** Suppose $f(x) \to +\infty$ as $x \to -\infty$ and $f(x) \to -\infty$ as $x \to +\infty$. *Describe* the end behavior of $g(x) = -f(x)$.

52. ★ **SHORT RESPONSE** A cubic polynomial function f has leading coefficient 2 and constant term -5. If $f(1) = 0$ and $f(2) = 3$, what is $f(-5)$? *Explain* how you found your answer.

⬤ = **WORKED-OUT SOLUTIONS**
on p. WS1

◆ = **TAKS PRACTICE**
AND REASONING

◆◆ = **MULTIPLE**
REPRESENTATIONS