

3.1 Practice B

In Exercises 1–4, decide whether the function is a polynomial function. If so, write it in standard form and state its degree, type, and leading coefficient.

1. $h(x) = 6x^3 - 9x^{-3} + x^2 - 5x - 1$

2. $f(x) = 11x^2 - \sqrt{7} + 12x$

3. $g(x) = 2x^4 - \frac{1}{3}x^2 - \sqrt{14}x^3 + 2x - \frac{5}{3}$

4. $f(x) = 2x^3 + 9x^2 - 5x + \frac{4}{x} - 1$

In Exercises 5–7, evaluate the function for the given value of x .

5. $f(x) = -x^3 + 5x^2 + 9x + 4$; $x = -11$

6. $g(x) = 3x^3 + 6x^2 + 12x - 10$; $x = \frac{1}{3}$

7. $h(x) = 9x^3 - 8x^2 + 11x + 8$; $x = -\frac{1}{2}$

In Exercises 8 and 9, describe the end behavior of the graph of the function.

8. $g(x) = -5x^4 + 7x^3 - 7x^6 + x^2 - 9x + 2$

9. $h(x) = -2x^3 + 5x^2 + 4x^5 - 3x^4 + 12x^2 - 4$

In Exercises 10–13, graph the polynomial function.

10. $q(x) = x^4 - x^3 - 5x^2$

11. $h(x) = 4 - 2x^2 - x^4$

12. $k(x) = x^5 - 2x^4 + x - 2$

13. $f(x) = x^6 - 3x^5 + 2x^3 + x + 1$

In Exercises 14 and 15, sketch a graph of the polynomial function f having the given characteristics. Use the graph to describe the degree and leading coefficient of the function f .

14. f is increasing when $x < 1$; f is decreasing when $x > 1$.

$$f(x) > 0 \text{ when } -1 < x < 3; f(x) < 0 \text{ when } x < -1 \text{ and } x > 3.$$

15. f is increasing when $x < -1.1$ and $x > 2.4$; f is decreasing when $-1.1 < x < 2.4$.

$$f(x) > 0 \text{ when } -2 < x < 0 \text{ and } x > 4; f(x) < 0 \text{ when } x < -2 \text{ and } 0 < x < 4.$$

16. The function $h(t) = -4.9t^2 + 28.62t + 2.4$ models the height h of a high pop-up hit by a baseball player after t seconds. Use a graphing calculator to graph the function. State an appropriate window to view the maximum height of the ball and when the ball hits the ground.