

**4.1** Notetaking with Vocabulary (continued)**Extra Practice**

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.  $f(x) = 2x^2 - 3x^4 + 6x + 1$

2.  $m(x) = -\frac{3}{7}x^3 + \frac{7}{x} - 3$

3.  $g(x) = \sqrt{15}x + \sqrt{5}$

4.  $p(x) = -2\sqrt{3} + 3x - 2x^2$

In Exercises 5 and 6, evaluate the function for the given value of  $x$ .

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

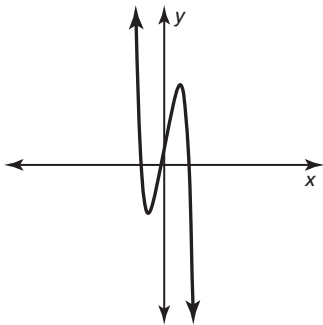
6.  $g(x) = x^4 - 32x^2 + 256; x = -4$

In Exercises 7 and 8, describe the end behavior of the graph of the function.

7.  $f(x) = -3x^6 + 4x^2 - 3x + 6$

8.  $f(x) = \frac{4}{5}x + 6x + 3x^5 - 3x^3 - 2$

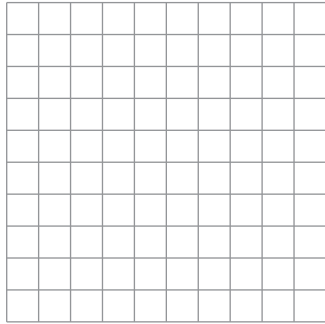
9. Describe the degree and leading coefficient of the polynomial function using the graph.



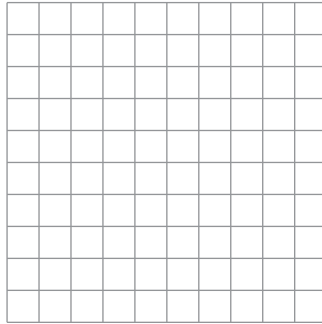
**4.1 Notetaking with Vocabulary (continued)**

In Exercises 10 and 11, graph the polynomial function.

10.  $p(x) = 16 - x^4$



11.  $g(x) = x^2 + 3x^5 - x$



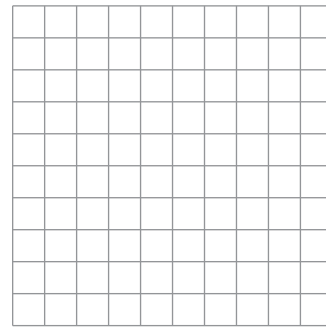
12. Sketch a graph of the polynomial function  $f$  if

$f$  is increasing when  $x < -1$  and  $0 < x < 1$ ,

$f$  is decreasing when  $-1 < x < 0$  and  $x > 1$ ,

and  $f(x) < 0$  for all real numbers.

Describe the degree and leading coefficient of the function  $f$ .



13. The number of students  $S$  (in thousands) who graduate in four years from a university can be modeled by the function  $S(t) = -\frac{1}{4}t^3 + t^2 + 23$ , where  $t$  is the number of years since 2010.

a. Use a graphing calculator to graph the function for the interval  $0 \leq t \leq 5$ . Describe the behavior of the graph on this interval.

b. What is the average rate of change in the number of four-year graduates from 2010 to 2015?

c. Do you think this model can be used for years before 2010 or after 2015? Explain your reasoning.