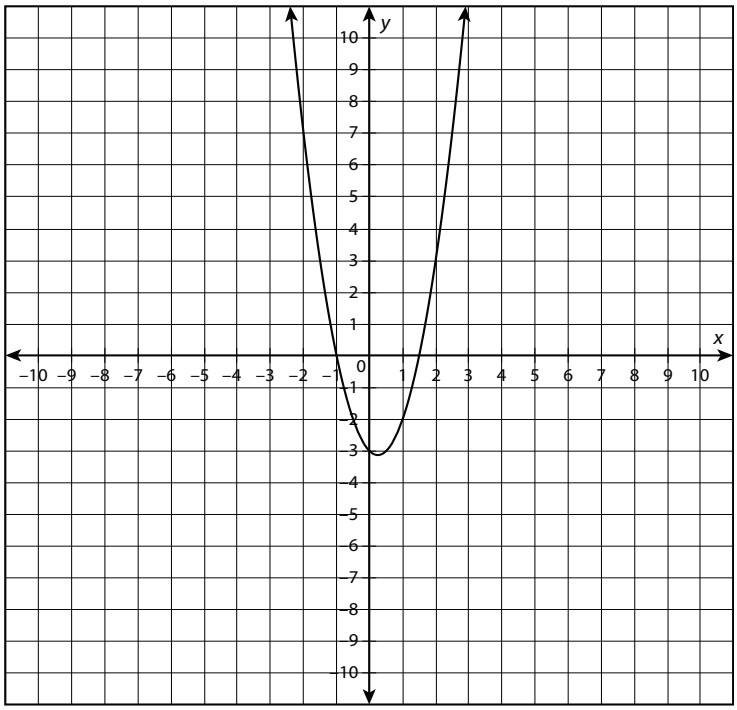
Graphing Polynomial Functions

Progress Assessment

Circle the letter of the best answer.

1. A function $y = ax^2 + bx + c$ is represented by the following graph:



Which of the following functions could represent the graph?

a. $f(x) = x^2 + 6x + 9$

b. $f(x) = 2x^2 - x - 3$

c. $f(x) = x^2 - 7x + 10$

d. $f(x) = x^2 + 5x$

2. What is the focus of the parabola with equation $y = x^2 - 4x$?

a. (2, –3)

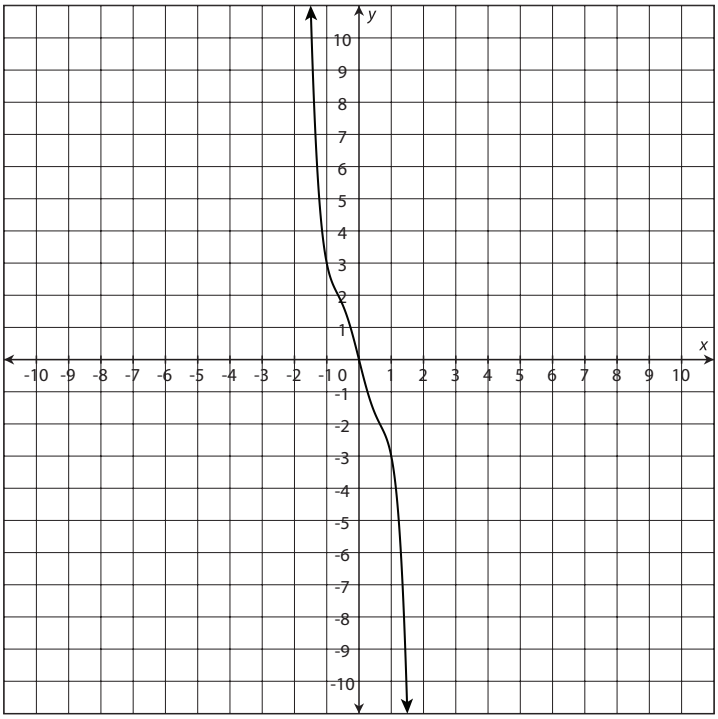
b. (2, –4.25)

c. (2, –4)

d. (2, –3.75)

continued

3. What must be true about the degree and leading coefficient of the graphed polynomial?



a. The polynomial is an odd-degree function and has a positive coefficient.

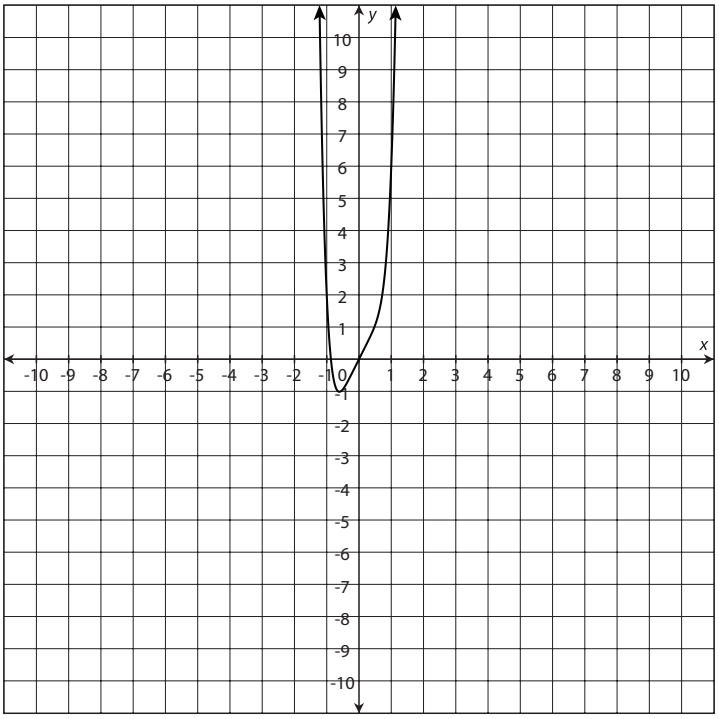
b. The polynomial is an odd-degree function and has a negative coefficient.

c. The polynomial is an even-degree function and has a positive coefficient.

d. The polynomial is an even-degree function and has a negative coefficient.

continued

4. Which function could possibly represent the graphed function?



a. $f(x)=-4x^6-2x$

b. $f(x)=4x^5+8x$

c. $f(x)=4x^6+2x$

d. $f(x)=-4x^5+3x$

5. What is the remainder when $(x^3 - 4x^2 + 10)$ is divided by $(x - 3)$?

a. 1

b. –53

c. 31

d. 7

6. Which of the following is the result of using synthetic division to divide $(x^3 - 4x^2 + 9)$ by $(x - 1)$?

a. $x^2-3x-3+\frac{6}{x+1}$

b. $x-3+\frac{6}{x-1}$

c. $x^2-5x+5+\frac{4}{x-1}$

d. $x^2-3x-3+\frac{6}{x-1}$

continued

7. Which polynomial function has zeros of –5, –3, and 4?

   a. $f(x) = x^3 + 12x^2 + 47x + 60$

   b. $f(x) = x^3 - 12x^2 + 47x - 60$

   c. $f(x) = x^3 - 4x^2 - 17x + 60$

   d. $f(x) = x^3 + 4x^2 - 17x - 60$

8. A polynomial has zeros of 3, 5, and $2i$. What is the minimum degree of the polynomial?

   a. 3

   b. 4

   c. 5

   d. 6

9. What are all the possible rational roots for the polynomial equation $3x^3 + 8x^2 - 4x - 12 = 0$?

   a. $\pm\frac{1}{12}, \pm\frac{1}{6}, \pm\frac{1}{4}, \pm\frac{1}{3}, \pm\frac{1}{2}, \pm\frac{3}{4}, \pm1, \pm\frac{3}{2}, \pm3$

   b. $\pm\frac{1}{3}, \pm1, \pm4, \pm12$

   c. $\pm\frac{1}{3}, \pm\frac{2}{3}, \pm1, \pm\frac{4}{3}, \pm2, \pm3, \pm4, \pm6, \pm12$

   d. $\pm\frac{1}{12}, \pm\frac{1}{4}, \pm1, \pm3$

10. Which of the following is a possible root of the polynomial $12x^3 + 9x^2 - 7x + 8$?

    a. 3

    b. 6

    c. $\frac{3}{2}$

    d. $\frac{8}{3}$

continued

Name: **Date:**

Assessment

Use what you have learned about polynomial functions to complete the following problem.

11. A third-degree polynomial with rational coefficients has the roots 3 and $(2 + i)$.

    a. What are the additional roots?

    b. What is this polynomial?

    c. What is the degree of this polynomial?

    d. Identify the end behavior and maximum number of turning points of the graph of the polynomial.