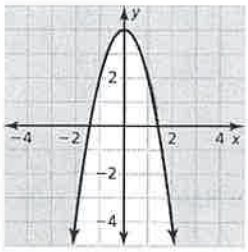
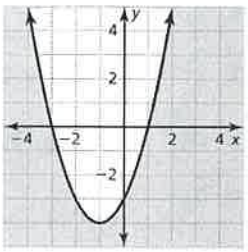
Answers

2.



3.



4. $(-2, 2)$ and $(2, -2)$

5. 32; two real solutions

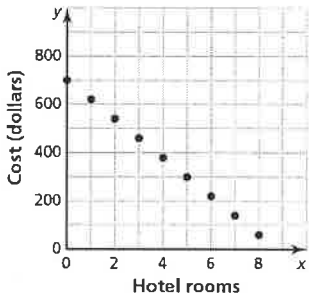
6. $x = -4 \pm i\sqrt{14}$

7. $a_n = 6(2)^x$; $a_8 = 1536$

8. a. 700 represents the total amount the club has to spend on hotel rooms, $80r$ represents the amount the club spends on r hotel rooms, 80 represents the cost of each hotel room.

b. 0, 1, 2, 3, 4, 5, 6, 7, 8; The domain is discrete because the club cannot book part of a hotel room.

c.



Chapter 3 Test Prep

1. C **2.** D **3.** B **4.** C

5. B **6.** $y = -\frac{1}{4}x^2 + x + 3$

7. 10 months **8.** A

9. D **10.** 256 feet

11. A, C, E, F **12.** B, C

13. D **14.** C

15. \$1215 **16.** $34 - 18i$

Chapter 4

4.1 Extra Practice

1. polynomial function;
$f(x) = -3x^4 + 2x^2 + 6x + 1$;
degree: 4 (quartic), leading coefficient: -3

2. not a polynomial function

3. polynomial function; $g(x) = \sqrt{15}x + \sqrt{5}$;
degree: 1 (linear), leading coefficient: $\sqrt{15}$

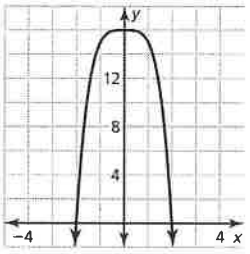
4. polynomial function; $p(x) = -2x^2 + 3x - 2\sqrt{3}$;
degree: 2 (quadratic), leading coefficient: -2

5. -18 **6.** 0

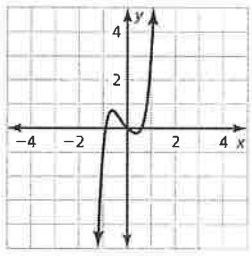
7. $f(x) \to -\infty$ as $x \to -\infty$ and $f(x) \to -\infty$ as $x \to +\infty$

8. $f(x) \to -\infty$ as $x \to -\infty$ and $f(x) \to +\infty$ as $x \to +\infty$

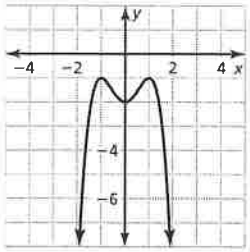
9.



10.



11. *Sample answer:*



The degree is even and the leading coefficient is negative.

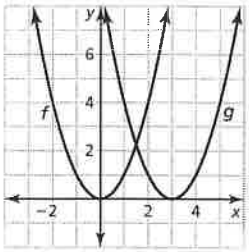
12. $g(6) = -317$; Substituting the two given points into the function results in the system of equations $24 + 4b - 2c + 7 = 67$ and $-3 + b + c + 7 = 13$. Solving for b and c gives $g(x) = -3x^3 + 9x^2 + 7$.

4.1 Review & Refresh

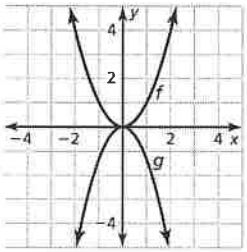
1. $2m^4 + 6a$ **2.** $g(x) = -|x - 1| + 4$

Answers

3. The graph of g is a horizontal translation 3 units right of the graph of f.



4. The graph of g is a vertical stretch by a factor of $\frac{4}{3}$ and a reflection in the x-axis of the graph of f.

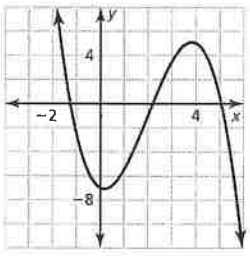


5. $\left(-\frac{2}{3}, -\frac{53}{9}\right)$ and $(3, -1)$; Explanations will vary.

6. yes; no; The javelin reaches a maximum height of 106 feet.

7. $\frac{3-\sqrt{21}}{4} \leq x \leq \frac{3+\sqrt{21}}{4}$; Explanations will vary.

8.



9. polynomial function;
$f(x) = -7x^4 + \pi x^3 + \frac{2}{9}x - 8$;
degree: 4 (quartic), leading coefficient: -7

4.2 Extra Practice

1. $-5x^2 + x + 26$

2. $7x^2 - 36x + 111$

3. $-x^3 - 8x^2 + 17x - 15$

4. $-3x^5 + 4x^3 - 4x^2 + 2x + 5$

5. $4x^5 - 2x^4 + 6x^3 - 10x^2$

6. $3x^6 - 6x^5 - 31x^4 + 60x^3 + 85x^2 - 150x - 25$

7. $x^3 + 5x^2 - 8x - 12$

8. $10x^3 - 83x^2 + 150x - 72$

9. $9y^2 - 64$

10. $81m^2 + 90m + 25$

11. $8v^3 - 12v^2 + 6v - 1$

12. $a^3b^3 + 21a^2b^2 + 147ab + 343$

13. $256t^4 - 512t^3 + 384t^2 - 128t + 16$

14. $g^5 + 30g^4 + 360g^3 + 2160g^2 + 6480g + 7776$

15. $7x^2 + 9x - 8$

16. $\frac{4}{3}\pi x^3 + 12\pi x^2 + 27\pi x + 18\pi$

4.2 Review & Refresh

1. $x \approx -1.135$ and $x \approx 1.468$

2. $-3x^2 + 9x - 3$

3. $2x^4 - 2x^3 + x^2 - 7x - 4$

4. $2x^3 + 11x^2 - 4x - 24$

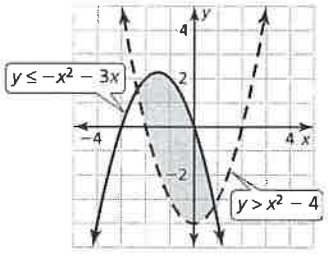
5. $x^3 + 15x^2 + 75x + 125$

6. $x = \frac{1}{16}y^2$

7. $f(x) \to +\infty$ as $x \to -\infty$ and $f(x) \to -\infty$ as $x \to +\infty$

8. 11; The axis of symmetry is $x = 8$, so the other x-intercept is 3 units right of $(8, 0)$.

9.



10. $y = \frac{1}{2}$

11. $5 + 4i$

12. $6 - 10i$

13. $46 + 4i$

14. 15 one-dollar bills, 5 five-dollar bills, and 3 ten-dollar bills

Answers

4.3 Extra Practice

1. $x + 9 + \frac{39}{x - 3}$

2. $x - 4 + \frac{16x - 64}{x^2 - 16}$

3. $x^2 + 3x + 6$

4. $x^2 + 3x + 8 + \frac{11x}{x^2 - x}$

5. $x - 8 - \frac{14}{x - 2}$

6. $x^2 + 2x + 2$

7. $2x^2 - 6x + 18 - \frac{108}{x + 3}$

8. $2x^3 - 3x^2 - x + \frac{4}{x - 4}$

9. A; $(4)^2 - (4) - 8 = 4$ so the remainder must be 4.

10. D; $(4)^2 - (4) + 8 = 20$ so the remainder must be 20.

11. B; $(4)^2 + (4) - 8 = 12$ so the remainder must be 12.

12. C; $(4)^2 + (4) + 8 = 28$ so the remainder must be 28.

13. $f(2) = -48$

14. $f(-1) = 4$

15. $f(-5) = -560$

16. $f(3) = 78$

17. $k = 46$

4.3 Review & Refresh

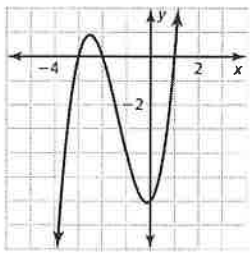
1. $x = 7$

2. $x = \pm 5i$

3. $f(-2) = -15$

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

5. $k = 2$

6. 

7. $2x^2 - 2x + 2 + \frac{-5x + 7}{x^2 + x - 3}$

8. $x = 9$

9. $x = -4$

10. $\frac{1}{4}$, or 25%

11. $2x^2\sqrt{10x}$

12. $\frac{\sqrt{5}}{8}$

13. $-2\sqrt{3}$

14. at least 10 yd and at most 90 yd

4.4 Extra Practice

1. $20x(x - 6)(x - 5)$

2. $m(m + 3)(m - 3)(m^2 + 9)$

3. $(3a + 2b)(9a^2 - 6ab + 4b^2)$

4. $t^3(5t + 2)(t + 1)(t - 1)$

5. $(y + 4)(y - 4)(y^2 + 3)$

6. $5(p - 1)(p^2 + 1)$

7. $10(3k + 2)(3k - 2)(9k^2 + 4)$

8. $(a^2 + 1)(a^2 + a + 1)(a - 1)$

9. $2x^4(x - 7)(x + 3)$

10. $(5z^2 - 6)(z + 1)$

11. $2(2x - 5)(3x + 2)$

12. $3m^2(1 - 2m)(1 + 2m)(1 + 4m^2)$

13. $x(2x - 1)^2$

14. $5m^2(m - 7)^2$

15.
$$\begin{array}{r|rrrr} -1 & 1 & 0 & -13 & -12 \\ & & -1 & 1 & 12 \\ \hline & 1 & -1 & -12 & 0 \end{array}$$

$f(x) = (x + 1)(x - 4)(x + 3)$

16.
$$\begin{array}{r|rrrr} 2 & 6 & 8 & -34 & -12 \\ & & 12 & 40 & 12 \\ \hline & 6 & 20 & 6 & 0 \end{array}$$

$f(x) = 2(x - 2)(x + 3)(3x + 1)$