

## Answers for 5.5

For use with pages 366–369

### 5.5 Skill Practice

1. If a polynomial  $f(x)$  is divided by  $x - k$ , then the remainder is  $r = f(k)$ .
2. The red numbers are the coefficients of the quotient and the blue number is the remainder.
3.  $x + 5 + \frac{3}{x - 4}$
4.  $3x + 4 + \frac{-6}{x - 5}$
5.  $x^2 + 4x + 7 + \frac{9}{x - 1}$
6.  $2x + 9 + \frac{8}{4x - 1}$
7.  $3x + 8 + \frac{-4x + 1}{x^2 + x}$
8.  $7x + 11 + \frac{-6}{x^2 + 1}$
9.  $5x^2 - 12x + 37 + \frac{-122x + 109}{x^2 + 2x - 4}$
10.  $4x^2 + 12x + 44 + \frac{161x + 84}{x^2 - 3x - 2}$
11.  $2x + 3 + \frac{25}{x - 5}$
12.  $4x - 5 + \frac{-15}{x - 2}$
13.  $x + 4 + \frac{-15}{x + 4}$
14.  $x + 3 + \frac{18}{x - 3}$
15.  $x^2 - x - 4 + \frac{-18}{x - 4}$
16.  $x^2 - 3x + 5 + \frac{-9}{x + 3}$
17.  $x^3 + x^2 - 2x + 1 + \frac{-6}{x - 6}$
18.  $x^3 - x^2 + 5x - 9 + \frac{10}{x + 5}$
19. The degree of the answer should be reduced by 1;  
 $x^2 + 2x - 1 + \frac{1}{x - 2}$ .
20. The coefficient of  $x^2$  was not included.  
 $x^2 + 2x - 1 + \frac{1}{x - 2}$   

2	1	0	-5	3
		2	4	-2
	1	2	-1	1
21.  $(x - 6)(x - 5)(x + 1)$
22.  $(x - 1)(x + 3)(x + 4)$
23.  $(x - 8)(x + 2)(x + 4)$
24.  $(x + 3)(x + 5)(x + 10)$
25.  $(x - 4)(x - 3)(x + 9)$
26.  $(x - 6)(x - 5)(x + 2)$
27.  $(2x - 7)(x - 3)(x - 1)$
28.  $(x - 5)(3x + 1)(x + 4)$
29.  $-1, 6$
30.  $-4, \frac{1}{4}$

## Answers for 5.5 *continued*

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31.  $-\frac{2}{5}, \frac{3}{2}$

32.  $-8, \frac{2}{3}$

33.  $\frac{-4 \pm \sqrt{14}}{2}$

34.  $\frac{11 \pm \sqrt{41}}{10}$

35. D

36.  $2x + 5$

37.  $x + 8$

38. a.  $-3, 6$

b.  $(x - 6)(x - 2)(x + 3)$

c.  $-3, 2, 6$

39. A

40. a. 0.5

b.  $(x - 0.5)(15x^2 + 11x - 14)$

c.  $(2x - 1)(3x - 2)(5x + 7)$

### 5.5 Problem Solving

41. 1 million T-shirts

42. 2 million MP3 players

43.  $f(x) = -0.132x^2 + 11.2x - 560.9 + \frac{408,803}{14.8x + 725}$

44. a.  $40x - 4x^3$

b.  $P = 25x - 4x^3$

c.  $24 = 25x - 4x^3$ , 1.386,  $-2.886$ ; 1,386,000 radios

d. No; the negative solution does not make sense because the company cannot produce a negative number of radios.

45.  $-0.002329x^3 + 0.2491x^2 - 21.0225x + 1737.15 - \frac{444,692}{3.1x + 256}$ ; divided the

overnight stays function by the total visits function

46. The only other solution is  $-4$ . The company cannot produce a negative number of DVDs.

### 5.5 Mixed Review

47. solution, not a solution

48. solution, not a solution

49. not a solution, solution

50. not a solution, solution

51.  $-8, 5$

52.  $-2, -\frac{3}{5}$

53.  $\frac{-7 \pm \sqrt{41}}{2}$

## Answers for 5.5 *continued*

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54.  $\frac{-15 \pm \sqrt{65}}{8}$

55.  $\frac{-15 \pm i\sqrt{23}}{4}$

56.  $-1 \pm 3i$

57.  $-2x^2 + 2x + 3$

58.  $-3x^2 + 2x + 15$

59.  $9x^4 - 6x^3 - 8x^2 - 24x + 32$

60.  $27x^3 - 135x^2 + 225x - 125$

### 5.1–5.5 Mixed Review of Problem Solving

1. a.  $1.64 \times 10^{11}$   
 b. about  $1.37 \times 10^9$  football fields
2. a.  $T(x) = 8x^3$   
 b.  $C(x) = 8x^3 - 36x^2 + 48x + 16$   
 c.  $I(x) = T(x) - C(x)$   
 d.  $I(x) = 36x^2 - 48x - 16$ ;  
 $1904 \text{ in.}^3$
3. They will both exchange at the same rate because they both have a surface area-to-volume ratio of  $\frac{6}{x}$ .
4. *Sample answer:*  
 $f(x) = -3x^4 + 2x^3 + 12$

5. a. degree: 4, type: quartic

b.

<b>t</b>	0	1	2
<b>C</b>	51	46.14	42.33

<b>t</b>	3	4	5
<b>C</b>	40.50	40.97	43.38

<b>t</b>	6	7	8
<b>C</b>	46.73	49.38	49.05

c. No; cell phone bills will not be a negative amount as the function shows after 2005.

6. a.  $r = 100x - 10x^3$

b.  $P = 70x - 10x^3$

c.  $60 = 70x - 10x^3$ ;  $-3, 1$

d. No; the manufacturer cannot produce a negative number of cameras.

7. 4 ft;

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