Selected Answers

Chapter 1

Lesson 1, pages 3-4
5. $1 \cdot 30, 2 \cdot 15, 3 \cdot 10, 5 \cdot 6$
7. See page 1 for a complete set of labeled blocks.
8. $5x = 30$ and $x^2 = 36$
9. $5x = 31$ and $x^2 = 38.44$

Lesson 3, page 6
1. a. 9
   b. 17
   c. 3
   d. 11.19
2. a. 25
   b. 16
   c. 13
   d. 20
3. a. 70
   b. 25
   c. 19.4
   d. $29\frac{1}{2}$

Lesson 4, page 8
1. $4y$
2. $x + 4$
3. $y + 2x$
4. $3x^2 + 2x + 6$
5. $2y^2 + 2x + 3$
6. $x^2 + 3x + 3$
7. $3x^2 + 2y + 5$
8. $3x^2 + 2x + 10$
9. $3x^2 + +2xy + y$

Lesson 5, page 9
1. negative 3
2. subtract 2 from 5, 3
3. the opposite of negative 5, or 5
4. subtract 7 from 3, negative 4
5. the opposite of $(4 + \frac{1}{2})$, negative $4\frac{1}{2}$
6. the opposite of 6 subtracted from 2, 4
7. x subtracted from 3
8. the opposite of negative x, x
9. y
10. the opposite of $(4x + 1)$
11. 5 subtracted from y
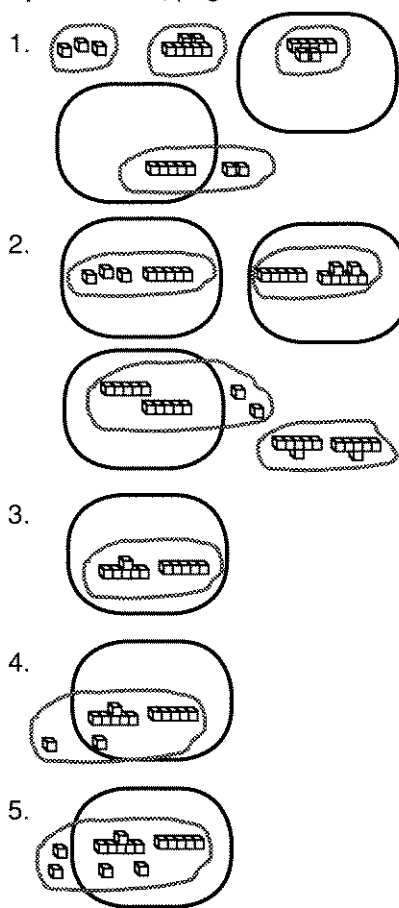12. the opposite of x subtracted from y

Exploration 1, page 9
1. a. -2
   b. 3

2. a. false
   b. true

Lesson 6, pages 10-11
1. 4
2. -3
3. 19
4. -1
5. 2
6. -15
7. -1
8. -3
9. 13
10. -15

Exploration 2, page 14

Chapter 2

Lesson 1, pages 16-17
1. No, the order doesn't matter.
2. $-6 + (-3) = -9$
3. $25 + 4 + (-12) + (-1) = 16$
4. -3
5. -18

6. 1
7. 6
8. -20
9. -18
10. 5
11. 18
12. 0

Lesson 2, page 20
1. -4
2. 4
4. -10
5. -2
6. -11
7. 13
8. -14
9. 5
10. 9
11. -5
12. 10
13. -14
14. -23
15. -20
16. 10
17. -11
18. 9

Lesson 3, page 22
3. Changing the order of the numbers does not affect the answer.
4. -8
5. -6
6. 20
7. 12
8. -20
9. -21
10. -3
11. 6
12. -5
13. 6
14. multiplication
15. 2
16. -3
17. -4
18. 5
20. Blocks inside the minus area move outside; blocks outside the minus area move inside.

Selected Solutions

Lesson 4, page 23
5. two squared
6. negative four, squared
7. the opposite of three squared
8. six x squared
9. negative six x, squared
10. the opposite of six x squared
11. $(6x)^2$ and $-(6x)^2$ are equal
12. 2 is the exponent, 7 is the base
13. 3 is the coefficient

Exploration 1, page 23
1. P
2. P
3. N
4. P or 0
5. P or 0
6. P or 0

Lesson 5, page 24
5. 6.16
6. 3.9
7. −3066.1
8. $-\frac{1}{2}$
9. $-\frac{5}{6}$
10. $-\frac{2}{18}$

Lesson 6, pages 25-26
1. What times −2 equals −8?
2. What times 2 equals −8?
6. a., b., and e. are equal; c. and d. are equal

Exploration 2, page 27
1. area 31, perimeter 32
2. area 31, perimeter 24
3. area 31, perimeter 28

Exploration 3, page 28
1. volume 1, surface area 6
2. volume 25, surface area 70
3. volume 100, surface area 130
4. volume 36, surface area 84
5. volume 36, surface area 94
6. volume 36, surface area 92

Chapter 3

Lesson 1, pages 30-31
1. −5
2. to show −(−3), the opposite of −3, or 3
3. −10
4. a. $-(x + 5) + (x^2 − 1) + 5x$
    b. $x^2 = 4$, blocks show 6
    c. $x^2 = 9$, blocks show −9
    d. −1

5. a. $-(y^2 + y + x) + x^2 + 10 + (xy − x)$
    b. $x^2 = 1$, $y^2 = 4$, $xy = −2$, blocks show 6
    c. 13
    d. −20

Lesson 2, page 32
1. $5 \cdot 7 = 35$
2. $\frac{35}{7} = 5$
3. $\frac{35}{5} = 7$
5. Impossible to build a rectangle with length 0.
6. If $\frac{12}{0} = 0$ was true,
    then $0 \cdot 0 = 12$ would have to be true.

Exploration 1, page 33
1. length $2x + 12$, width x
2. length $x + y + 1$, width x
3. length $y + x + 5$, width y
4. length $3x + 6$, width x; length $x + 2$, width $3x$
5. length $3x$, width $x + 3$
6. length y, width $3x + 2 + y$
7. Impossible, you can't make a rectangle.
8. length x, width $x + 5$

Lesson 3, page 34
3. $x^2 + x$
4. $x^2 + 5x + 6$
5. $x^2 + 5x + xy + 5y$
6. $2y^2 + 2y$
7. $y^2 + 5y + 4$
8. $2x^2 + 2xy + 5x + 3y + 3$
9. Show three groups of $4x^2 + 6$. The answer is $12x^2 + 18$.
10. Show 5 groups of $y^2 + 2y + 9$. The answer is $5y^2 + 10y + 45$.

Lesson 4, page 35
1. $\frac{(x^2 + 3x)}{x} = x + 3$
2. $x + 4$; $x(x + 4) = x^2 + 4x$
3. $2x + 3$; $3(2x + 3) = 6x + 9$
4. $x + y$; $x(x + y) = x^2 + xy$
5. $2x + 1$; $3x(2x + 1) = 6x^2 + 3x$
6. not possible with blocks
7. $2y + 3$; $2y(2y + 3) = 4y^2 + 6y$
8. $2y + 1$; $y(2y + 1) = 2y^2 + y$
9. $2y + x + 5$; $2(2y + x + 5) = 4y + 2x + 10$
10. make three groups of $2x^2 − 3$
11. make two groups of $2x^2 + 3x − 5$

Lesson 5, pages 36-37
1. a. $−5 > −7$
    b. $−5 < −1$
2. $−6 < 10$
3. $3 < 5$
4. $x = x$
5. $10 = 10$
6. $15 > 3$

Exploration 2, page 38
1. area = $5x$, perimeter = $2x + 10$
2. area = x^2, perimeter = $4x$
3. area = y, perimeter = $2y + 2$
4. area = $5y$, perimeter = $2y + 10$
5. area = y^2, perimeter = $4y$
6. area = xy, perimeter = $2x + 2y$

Lesson 6, pages 40-41
1. $4x − 5 + 2 − (2x − 3)$ and $3x^2 − x^2 + x + 2 − 1 − (2x^2 − 1)$
2. $2x$ and $x + 2$
3. $3x < 3x + 1$
4. $5x = 5x$
5. $3x + 5$ and $4x$; impossible to tell
6. $3x + x^2 + 1 > 3x$ (because $x^2 + 1$ is positive)

Lesson 7, page 42
1. a, b
2. a, c, d
3. c
4. a, c, d

Exploration 3, page 42
1. s.a. = $4x + 2$; v = x
2. s.a. = $2x^2 + 4x$; v = x^2
3. s.a. = $12x + 10$; v = $5x$
4. s.a. = $12y + 10$; v = $5y$
5. s.a. = $2y^2 + 4y$; v = y^2
6. s.a. = $2xy + 2y + 2x$; v = xy

Lesson 8, page 43
1. 25 is 20 more than 5; 25 is 5 times greater than 5.
2. 6 is 5 more than 1; 6 is 6 times greater than 1.
3. 4 is 2 more than 2; 4 is 2 times greater than 2.
4. 15 is 12 more than 3; 15 is 5 times greater than 3.
5. 42 is 35 more than 7; 42 is 6 times greater than 7.
6. 10 is 0 more than 10; 10 is 1 times greater than 10.
7. 9 is 1 more than 8; 9 is 1.125 times greater than 8.

Exploration 4, page 43
1. always
2. always
3. sometimes $(x = 2)$
4. sometimes $(y = 1)$
5. never
6. always (except $x = 0$)
7. never
8. sometimes $(x = 15)$

Chapter 4

Lesson 1, page 45
1. $-(x^2 + 2x + 12) + 3x^2 + 5x + 8$
2. 10
3. $2x^2 + 3x - 4$
4. 10
5. $-(y^2 - y)$
   $-y^2 + y$
6. $-(25 + x + x^2 - x - 5 - 2x - 1)$
   $-x^2 + 2x - 19$
7. $-(y^2 - y - 2x^2 + 2y + x) +$
   $(2xy + x^2 + 5x + 2x - x - 3)$
   $-y^2 - y + 3x^2 + 5x + 2xy - 3$
8. $-(4x^2 - 2x + 1 - 1) + 10x - x$
   $+ 10 - 1$
   $-4x^2 + 11x + 9$
9. $-(10x - x + 10 - 1) + 4x^2 - 2x$
   $+ 1 - 1$
   $4x^2 - 11x - 9$
10. $-(25 - x^2 + 5) + x^2 - 5x$
    $+ 11 + x$
    $2x^2 - 4x - 19$

Lesson 2, page 47
1. 4
2. no, $9 - (3 + 2) = 4$; $9 - 3 + 2$
   $= 8$
3. F
4. T
5. F
6. F
7. F
8. F
9. F
10. T
11. F
12. F
13. F
14. T
15. a plus sign

Lesson 3, page 48
1. $2x^2 + 2x + 1$
2. $x^2 + 2x + 7$
3. $2y^2 + 5y + 15$
4. $-y^2 - 2y + x^2 + 5x$

5. $2x^2 + y^2 + xy + 5y + 10$
6. $3x^2 + 2y^2 - 5x + 2xy + 5$
7. $3x^2 + 6x + 5$

Exploration 1, page 48
1. $6x$
2. 22
3. $4x + 2$
4. $2x + 14$
5. $4y + 2$
6. $2y + 2x + 10$

Lesson 4, pages 49-50
1. $-2x$
2. $-5y$
3. $5xy$
4. $-3x^2$
5. cannot simplify
6. $-9x$
7. $x^2 - 8x + 9$
9. $-5x + 4$
10. $x^2 - 8x + 7$
11. $2y^2 + 4y - 10$
12. $-5y - 4$
13. $-7x^2 + 8x - 5$
14. $-3y^2 + 3xy + x + 1$
15. $2x^2 - 2y^2 + x + 2xy - 7$
16. $6x^2 - y^2 - 5xy - 5y + 10$
17. $y^2 + 3x^2 - 4y - 5$
18. $6x + 9$

Lesson 5, page 51
1. b.
2. b.
3. d.
4. d.
5. a.
6. c.
7. $2x^2 - 4 + x + x^2 = 3x^2 + x - 4$
8. $2x^2 - 4 - x + x^2 = 3x^2 - x - 4$

Exploration 2, page 52
1. $4x$; $2x$; impossible to tell
2. $5x + 3 > 5x - 5$
3. $6x < 6x + 2x^2 + 3$
   because $2x^2 + 3$ is positive
4. $2x = 2x$
5. $2x + 3$; $3x + 2$;
   impossible to tell
6. $7x = 7x$

Exploration 3, page 52
1. $(x + 2)(x + 1)$
2. $(2x + 4)(x + 1)$ or
   $(x + 2)(2x + 2)$
3. $(4x + 2)(x + 1)$ or
   $(2x + 2)(2x + 1)$
4. $(x + 1)(x + y)$

5. $(x + 5)(x + 2)$
6. $(3x + 2)(x + 1)$
7. $(3x + 2)(2x + 1)$
8. $(3x + 2)(2x + 5)$
9. $(3x + 1)(x + 5)$
10. $(2x + 2)(2x + 2)$

Exploration 4, page 53
1. $2x^2 + 4x + 4$
2. $2y^2 + 4y + 2x + 2$
3. $16y + 10$
4. $2xy + 2y + 2x + 12$
5. $80 + 4x$

Exploration 5, page 53
1. S $(x = 1)$
2. N
3. S $(y = 1)$
4. A
5. N
6. A

Chapter 5

Exploration 1, page 55
1. $x(x + 7)$
2. $(x + 6)(x + 1)$
3. $(x + 5)(x + 2)$
4. $(x + 4)(x + 3)$
5. $(x + 6)(x + 2)$
6. $(x + 12)(x + 1)$

Exploration 2, page 55
1. $6 \cdot 6$
2. $7 \cdot 7$
3. not possible
4. $(2x)(2x)$
5. $(3x)(3x)$
6. $(x + 1)(x + 1)$
7. $(x + 3)(x + 3)$
8. $(2x + 1)(2x + 1)$
9. not possible
10. not possible
11. $(3x + 2)(3x + 2)$
12. $(x + y)(x + y)$

Lesson 1, page 56
1. $-2x$
2. $3y^2$
3. $-2xy$
4. is positive
5. is negative

Exploration 3, page 56
1. ?
2. N or 0
3. ?
4. P or 0

Lesson 3, page 59

1. $3x(2x+1) = 6x^2 + 3x$
2. $6x^2 - x - 1$
3. $2x^2 - 2x$
4. $y^2 + 4y$
5. $3x^2 + 3xy - 15x$
6. $4xy - 2y^2 + 12y$
7. $6x^2 - 9x$
8. $3x^2 + 13x - 10$
9. $y^2 - y - 12$
10. $2x^2 + 2xy + 8x + 4y + 8$
11. $2xy - 5x + x^2$
12. $2x^2 - x - 6$
13. $y^2 + 2xy + 2y + 10x - 15$
14. $2y^2 + xy - x^2 - 3y - 3x$

Lesson 4, page 60

1. $5x + xy$
2. $5x + xy$
3. $xy + 5y$
4. $xy + 5y$
5. $5x + 5y$
6. $xy - 5x$
7. $5y - xy$
8. $5y - 5x$
10. a. $rs + rt$
    b. $rt - st$
11. a. $-x - y$
    b. $x - y$
    c. $-x + y$
12. a. $-x - y$
    b. $x - y$
    c. $-x + y$

Lesson 5, pages 61-62

1. $(6 - x)(3x - 2)$
2. $(6 - x)(3x - 2)$
3. $-3x^2 + 20x - 12$
4. $-2x^2 + 11x - 12$
5. $2y^2 - 11y + 5$
6. $3x^2 + 7x + 2 +$
7. $2y^2 + 16y + 24$
8. $3x^2 - 5x - 2$
9. $2y^2 - 6y - 8$
10. $-2x^2 + 13x - 15$
11. $y^2 - 8y + 15$
12. $3x^2 + 12x - 15$
13. $2x^2 + 15x - 18$
14. $-2y^2 + 14y - 12$
15. $3x^2 + 5x - 2$

Lesson 6, pages 63-64

1. $2x + 1$
2. $(2x^2 + 5x + 4) / (2x + 1)$
3. $x + 2$
4. 2
5. $3x + 2$

6. $x + 2$
7. $3x + 1$
8. $2x + 2$
9. $3x + 1$, remainder 2
10. $x + 1$, remainder 6
11. $2x$, remainder 10
12. $x + 1$, remainder 4
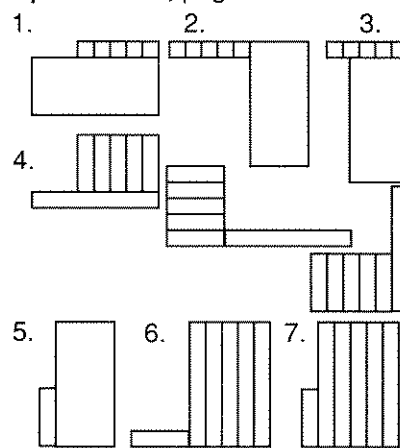13. $2x + 1$

Lesson 7, pages 65-66

1. $(y^2 - 3y + 2) / (y - 2)$
2. $y - 1$
3. $(y^2 + 3y - 10) / (y - 2)$
4. $y + 5$
5. $y - 2$
6. $3x - 3$
7. $x + 3$
8. $y - 2$
9. $x + 6$, remainder 7
10. $3x + 1$
11. $x - 3$
12. $2y + 5$, remainder 15

Lesson 8, page 67

1. 81
2. 3
3. 6
4. 6,7
5. 9,10
6. 7,8
7. 10,11
8. $4x^2$
9. $x^2 + 4x + 4$
10. $9y^2$
11. $y^2 + 6y + 9$

Exploration 4, page 69

1. If x is positive, $2x$ is greater, if x is negative, x is greater.
2. $x^2 > x$ if $x < 0$ or $x > 1$;
   $x^2 < x$ if $0 < x < 1$;
   $x^2 = x$ if $x = 0$ or $x = 1$
3. $x^2 > -1$
4. $x^2 \geq 0$
5. $x^2 + 1 \leq 3x^2 + 1$
6. $4 - 2x - x^2 > -2x^2 - 4x - 4$

Exploration 5, page 69

8. $2y + 2x + 2$
9. $4y + 30$
10. $2y + 6x + 10$

Exploration 6, page 70

1. $v = 1$, s.a. $= 6$
2. $v = 2$, s.a. $= 10$
3. $v = 4$, s.a. $= 16$
4. $v = 8$, s.a. $= 24$
5. $v = x$, s.a. $= 4x + 2$
6. $v = 2x$, s.a. $= 6x + 4$
7. $v = 4x$, s.a. $= 8x + 8$
8. $v = 8x$, s.a. $= 16x + 8$
9. $v = x^2$, s.a $= 2x^2 + 4x$
10. $v = 2x^2$, s.a. $= 2x^2 + 8x$
11. $v = 4x^2$, s.a. $= 4x^2 + 12x$
12. $v = 8x^2$, s.a. $= 8x^2 + 16x$

Exploration 7, page 70

1. N
2. S $(x = \frac{1}{4})$
3. A
4. A
5. A
6. S, when $x = 0$

Chapter 6

Exploration 1, page 72

1. $(x - 1)(x + 1) = x^2 - 1$
2. $(y - 1)(y + 1) = y^2 - 1$
3. $(5 - x)(5 + x) = 25 - x^2$
4. $(y - 5)(y + 5) = y^2 - 25$
5. $(y - x)(y + x) = y^2 - x^2$
6. $(y - 3)(y + 3) = y^2 - 9$
7. $(2x - 2)(2x + 2) = 4x^2 - 4$

Lesson 1, pages 72-73

1. 3 plus 4, times 2, plus 1.
4. $4 \cdot (2 + 3) = 20$
5. $\frac{1}{4} + \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{2}$

6. $5 \cdot (3 - 2 + 6) = 35$

7. $(32 + 2) \cdot (7 - 4) = 33$

8. $\frac{1}{3}(6 + 4 \cdot \frac{2}{6} - \frac{1}{3}) = \frac{7}{3}$

9. $(1 - 2) \cdot (2 + 5) \cdot 6 = -42$

10. $(4 + 6) \cdot (2 \cdot (5 - 3)) = 40$

11. $(3 + 1) \cdot (7 - 22) \cdot (9 - 7) = 24$

12. $2 \cdot 8 \cdot (\frac{1}{4} + \frac{2}{3}) \cdot (2 - \frac{1}{2}) = 22$

13. $\dfrac{5 \cdot \sqrt{12 + 4}}{6 - 2} = 5$

14. $\sqrt{\dfrac{(2 + 6)\, 3^2}{2}} = 6$

15. $\sqrt{3 \cdot (2 + 4) \cdot 2^3} = 12$

Lesson 2, page 74

1. $x^2 + xy + 6x + 5y + 5$
2. $x^2 + xy + x + 2y - 2$
3. $-x^2 + 6x + y^2 - 4y - 5$
5. $6x^2 + 5x - 6$
6. $-11x + 2x^2 - 5y + 2xy + 15$
7. $y^2 + y - 12$
8. $xy + y^2 - y - 2x^2 + 13x - 20$
9. $3x^2 + 11x - 20 - 3xy + 4y$
10. $3xy + x - 2x^2 + 2y^2 - 7y + 3$
11. $2x^2 + 3xy + x + y^2 - 1$
12. $4x^2 + 4xy - 8x + y^2 - 4y - 5$
13. $-x^2 + 10x + y^2 - 25$

Exploration 3, page 75

1. P
2. N
3. N
4. ?
5. ?
6. ?
7. 2 and 3
8. 5 and 6

Lesson 4, page 76

1. $x^2 + 6x + 9$
2. $x^2 + 10x + 25$
3. $x^2 + 2xy + y^2$
5. False
6. $y^2 - 4$
7. $y^2 - 25$
8. $y^2 - x^2$
10. $y^2 - 6y + 9$
11. $y^2 - 10y + 25$
12. $y^2 - 2xy + x^2$
14. False
15. $4x^2 - 12x + 9$
16. $4y^2 + 4xy + x^2$
17. $16y^2 - 1$
18. $9x^2 - 16$
19. $9y^2 + 30y + 25$
20. $25x^2 - 20xy + 4y^2$
21. $x^2 + 2xy + y^2 + 4x + 4y + 4$
22. $x^2 + 2xy + y^2 - 10y - 10x + 25$
24. $a^2 - 2ab + b^2 + 2ca - 2cb + c^2$

Lesson 5, pages 77-79

1. $(6x^2 + 5x - 10) / (2x + 5)$
2. $(3x - 5)$, remainder 15
3. $2x + 3$
4. $2x$, remainder 5
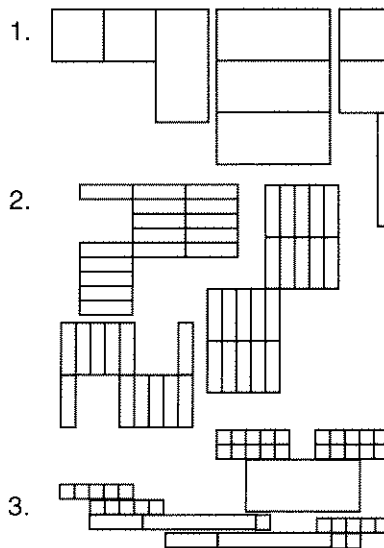5. $y + 6$, remainder -30
6. $2x$, remainder 13

Lesson 6, page 80

1. $2y$, remainder 5
2. $4x - 3$, remainder 5
4. $x^2 - 2x + 3$, remainder -3
5. $2x + 3$, remainder 3

Exploration 4, page 81

1. When x is negative, $x^2 > x$. When $x = 0$ or 1, $x^2 = x$. When $0 < x < 1$, $x^2 < x$. When $x > 1$, $x^2 > x$.
2. When $x = 0$, $x^2 = 2x^2$. For all other values, $x^2 < 2x^2$.
3. When $x > 1$, $x^3 > x^2$. When $x = 0$ or 1, $x^3 = x^2$, otherwise $x^3 < x^2$.
4. When $x = -1$, 0, or 1, $x^3 = x$. If $x < -1$ or $0 < x < 1$, $x^3 < x$. If $-1 < x < 0$ or $x > 1$, $x^3 > x$.
5. $-3x + 13 \ ? \ -x + 7$
   The two sides are equal when $x = 3$. When $x < 3$, the left side is greater.
6. $x^2 + 4x - 2 > -x^2 + 4x - 2$

Exploration 5, page 82

1.

2.

3.

Exploration 6, page 82

1. $2y^2 + 8x + 6y + 2$
2. $12y + 2x + 34$

Exploration 1, page 84

1. The sides are equal if $x = -3$. The left side is greater for $x < -3$.
2. $4x < 4x + 5$
3. The sides are equal if $x = \pm 1$. The left side is greater for $-1 < x < 1$.
4. $8x + 9 > -x^2 + 8x + 9$
5. $3x^2 + 2x > 3x^2 + 2x - 5$
6. The sides are equal if $x = -5$. The left side is greater for $x < -5$.
7. The sides are equal if $x = -13$. The left side is greater for $x > -13$.

Lesson 1, page 84-86

1. N
2. S
3. A
4. $x = 5$
5. $2x + 22 - 1 - (x + 5 + 1) = 6x + 11 - 1 - (x + 5 - x)$
6. $x = 2$
8. $x = 3$
9. $3 = x$
10. $x = 5$
11. $x = -1$
12. $x = -1$
13. $x = \frac{7}{5}$

Exploration 2, page 88

1. $x = -1$
2. $x = \frac{15}{2}$
3. $x = \pm 4$
4. identity
5. $x = 0$
6. identity
7. $x = 0$
8. $x = 0, \pm 1$
9. no solutions with real numbers
10. $x = -2$
11. $x = -2, 3$
12. $x = \pm \sqrt{10}$

Lesson 2, page 88

1. $y = 14$
2. $x = 3$
3. $x = 5$
4. $x = 2$
5. $x = 8$
6. $x = 2$

Lesson 3, pages 89-91
1. $3x + 13 = 6x - 5$
2. $x = 6$
3. $x = -3$
4. $x = 3$
5. $x = -2\frac{1}{2}$
6. $x = 4\frac{1}{2}$
7. $x = 2$
8. $x = -\frac{5}{3}$
9. $x = -\frac{23}{2}$
10. $x = \frac{12}{5}$

Lesson 4, page 92
3. $x = -4$
4. $x = \pm 5$
5. $x = 1\frac{1}{2}$
6. identity
7. $x = -2\frac{1}{2}$
8. no solutions
9. $x = -\frac{25}{3}$

Lesson 5, page 94
1. a, c, one solution for e
2. a, b, c, e (two solutions)
3. a, b, c, d, e

Exploration 3, page 95
1. $x(x + 10) = x^2 + 10x$
$(x + 1)(x + 9) = x^2 + 10x + 9$
$(x + 2)(x + 8) = x^2 + 10x + 16$
$(x + 3)(x + 7) = x^2 + 10x + 21$
$(x + 4)(x + 6) = x^2 + 10x + 24$
$(x + 5)(x + 5) = x^2 + 10x + 25$
2. $(x + 1)(x + 18) = x^2 + 19x + 18$
$(x + 2)(x + 9) = x^2 + 11x + 18$
$(x + 3)(x + 6) = x^2 + 9x + 18$

Exploration 4, page 95
1. $(x + 5)(x + 5) = x^2 + 10x + 25$
2. $(2x + 2)(2x + 2) = 4x^2 + 8x + 4$
3. $(3x + 1)(3x + 1) = 9x^2 + 6x + 1$
4. $(x + 1)(x + 1) = x^2 + 2x + 1$
5. $(2x + 3)(2x + 3) =$
$4x^2 + 12x + 9$
6. No
7. $(x + 5)(x + 5) = x^2 + 10x + 25$
8. $(2x + 5)(2x + 5) =$
$4x^2 = 20x + 25$
9. $(x + 6)(x + 6) = x^2 + 12x + 36$
10. $(3x + 1)(3x + 1) = 9x^2 + 6x + 1$
11. $(x + 3)(x + 3) = x^2 + 6x + 9$
12. No

Exploration 5, page 96

1.

1	4
2	6
3	8
4	10
10	22
100	202
n	$2n + 2$

2.

1	12
2	22
3	32
4	42
10	102
100	1002
n	$10n + 2$

3.

1	12
2	14
3	16
4	18
10	30
100	210
n	$2n + 10$

4.

1	12
2	16
3	20
4	24
10	48
100	408
n	$4n + 8$

5.

1	12
2	20
3	28
4	36
10	84
100	804
n	$8n + 4$

6.

1	12
2	18
3	24
4	30
10	66
100	606
n	$6n + 6$

Exploration 6, page 96

1.

1	6
2	10
3	14
4	18
10	42
100	402
n	$4n + 2$

2.

1	22
2	34
3	46
4	58
10	130
100	1210
n	$12n + 10$

3.

1	22
2	36
3	50
4	64
10	148
100	1408
n	$14n + 8$

4.

1	22
2	38
3	54
4	70
10	166
100	1606
n	$16n + 6$

Chapter 8

Exploration 1, page 98
1. T
2. T
3. T
4. F
5. If $a \neq 0$ and $b \neq 0$, then $ab \neq 0$.
6. Either $a = 0$ or $b = 0$.

Lesson 1, pages 98-99
2. $x = -6$, or $x = \frac{1}{2}$
3. $x = -6$, or $x = \frac{1}{2}$
4. $x = -\frac{1}{3}$, or $x = -5$
5. $x = 5$, or $x = -\frac{3}{2}$
6. $x = 1$, or $x = \frac{1}{3}$

Lesson 2, page 100
4. $(2x^2 + 11x - 6) / (x^2 + 6x)$
5. $(2x - 1) / x$
6. $2x / (x + 1)$
7. $4x / (x - 1)$
8. $(2x-1) / 3$

Lesson 3, pages 102-103
1. $xy + x^2 + 3x$
2. $x(y + x + 3)$
3. $x(2x - 1)$
4. not possible
5. $x(x + 2 + y)$
6. $3x(x - 1)$
7. $(x + 3)^2$
8. $(y - x)^2$
9. $(y + 2)(y - 2)$

Exploration 2, page 103
1. $x > -4$
2. $x > 6$
3. $x > -6$
4. $x > 6$
5. $x > 6$
6. $x > 4$
7. $x > 4$
8. $x > -6$
9. $x < -6$
11. $x < 6$

Lesson 4, pages 104-105
1. $(x + 2)^2$
2. $(3x + 1)^2$
3. not possible
4. not possible
5. $(x + y)^2$
6. not possible
8. $y^2 - 4y + 4$
9. $(y - 2)^2$
10. $(2y - 1)^2$
11. not possible
12. $(y - 3)^2$
13. $(y - 5)^2$
14. The square of a difference:
$(a - b)^2 = a^2 - 2ab + b^2$
15. $y^2 - 25$
16. $(y + 5)(y - 5)$
17. $(x + 1)(x - 1)$
18. $(y + 2)(y - 2)$
19. $(y + x)(y - x)$
21. $(2x + 1)^2$
22. $x(x + 2)$
23. $(y + 3)(y - 3)$
24. $(y - 4)^2$
25. not possible
26. $y = 4$ or -4
27. $x = -2$
28. $x = 0$ or -3
29. $x = -\frac{3}{2}$
30. $y = 4$

Lesson 5, page 106
1. $6x^2 + 8x + 2$
2. $(2x + 2)(3x + 1)$
3. $(3x + 1)^2$
4. $(2x + 1)(x + 2)$
5. $(x + 2)(x + 5)$
6. not possible
7. $(2x + 1)(x + 5)$

Lesson 6, page 107
1. $6x^2 - 8x + 2$
2. $(3x - 1)(2x - 2)$
3. $(y - 5)(y - 1)$
4. $(y - x)(y - 2)$
5. $(2x - 5)(2x - 1)$
6. $(3x - 2)(x - 1)$

Lesson 7, page 108
2. $6x^2 + x - 2$
3. $(2x - 1)(3x + 2)$
4. $y^2 - 2y - 3$
5. $2x^2 + 8x - 10$
6. $(3x - 5)(x + 2)$
7. $(x + 3)(2x - 4)$
8. $(2x - 3)(2x + 1)$
9. $(y - x)(y + 5)$

Lesson 8, page 109
1. $y(x + 6 + y)$
2. $(y + 4)(y - 4)$
3. $(3x - 2)(x + 5)$
4. $(2x + 2)(2x + 2)$
5. impossible
6. $(y - 2)(y - 3)$
7. $(y - 2)(y - 2)$
8. $(x + 6)(x + 2)$

Exploration 2, page 109

1.		
	1	$2x + 2$
	2	$4x + 2$
	3	$6x + 2$
	4	$8x + 2$
	10	$20x + 2$
	100	$200x + 2$
	n	$2nx + 2$

2.		
	1	$2x + 2$
	2	$2x + 4$
	3	$2x + 6$
	4	$2x + 8$
	10	$2x + 20$
	100	$2x + 200$
	n	$2x + 2n$

3.		
	1	$2x + 10$
	2	$2x + 20$
	3	$2x + 30$
	4	$2x + 40$
	10	$2x + 100$
	100	$2x + 1000$
	n	$2x + 10n$

4.		
	1	$2x + 10$
	2	$4x + 10$
	3	$6x + 10$
	4	$8x + 10$
	10	$20x + 10$
	100	$200x + 10$
	n	$2nx + 10$

5.		
	1	$2x + 10$
	2	$4x + 12$
	3	$6x + 14$
	4	$8x + 16$
	10	$20x + 28$
	100	$200x + 208$
	n	$2nx + 2n + 8$

Lesson 9, page 110
1. $(x^2 + 7x + 10) / (xy + 2y - x^2 - 2x)$
2. $(x + 5)(x + 2) / (y - x)(x + 2)$
3. $(x + 5) / (y - x)$
4. $5 / (y + x)$
5. $(x + 1) / (x - 2)$
6. $(x + 5) / (2x + y)$
7. $(y - 4) / (y - 3)$
8. impossible

Exploration 3, page 111

1.		
	1	$4x + 2$
	2	$8x + 2$
	3	$12x + 2$
	4	$16x + 2$
	10	$40x + 2$
	100	$400x + 2$
	n	$4nx + 2$

2.		
	1	$4x + 2$
	2	$6x + 4$
	3	$8x + 6$
	4	$10x + 8$
	10	$22x + 20$
	100	$202x + 200$
	n	$(2n + 2)x + 2n$

3.		
	1	$12x + 10$
	2	$24x + 10$
	3	$36x + 10$
	4	$48x + 10$
	10	$120x + 10$
	100	$1200x + 10$
	n	$12nx + 10$

4.		
	1	$12x + 10$
	2	$24x + 14$
	3	$36x + 18$
	4	$48x + 22$
	10	$120x + 46$
	100	$1200x + 406$
	n	$12nx + 4n + 6$

Chapter 9

Exploration 1, page 113
1. $y = 6 + 4x$
2. $y = 5 - 2x$
3. $y = 4 + 6x$
4. $y = 3 + 2x$
5. $y = 2x - 4$
6. $y = -x/2 + 4$
7. $y = x - 1$
8. $y = \frac{6}{5}x$

Exploration 2, page 113
1. b. $x = 4, y = 1$
2. $x = 4, y = 6$
3. $x = -\frac{7}{3}, y = \frac{11}{3}$
4. $x = \frac{3}{2}, y = 3$
5. $x = 8, y = -2$
6. $x = \frac{3}{2}, y = \frac{1}{2}$
7. $x = \frac{5}{3}, y = \frac{1}{3}$
8. either $x = 0, y = 0,$
   or $x = 1, y = 1$
9. $x = 2, y = \frac{1}{2}$
10. $x = -4, y = -10$
11. $x = 3, y = 1$
12. either $x = 2, y = 1,$ or
    $x = -1, y = -\frac{1}{2}$

Exploration 3, page 114
1. $x = -2, y = -6$
2. $x = 3, y = -2$
3. $x = 11, y = -3$
4. $x = 2, y = 1$
5. $x = 2, y = -\frac{1}{5}$
6. $x = -3, y = 0$
7. $x = -4, y = 3$
8. $x = 0, y = 3$
9. $x = 3, y = 7$

10. $x = -3, y = 5$
11. $x = -1, y = 5$
12. $x = 4, y = 1$

Lesson 1, pages 114-117
1. a. 11
   b. 9
   c. 15
   d. 10
   e. an infinite number
3. $x + 2y = 11, x - 2y = 3$
4. $x = 2y + 3$
5. $y = 2$
6. $x = 7$
8. $x = 4, y = 1$
9. $x = -3, y = 5$
10. All values that satisfy one
    equation satisfy the other.
11. $x = -2, y = -3$
12. no solution
13. $x = -1, y = 3$

Lesson 2, page 118
1. $x = -\frac{2}{3}$
2. $x = -2$ or $x = -\frac{5}{2}$
3. $x = \frac{3}{2}$ or $x = -\frac{3}{2}$
4. $x = -\frac{1}{3}$ or 1
5. $x = 0$ or $-\frac{5}{2}$
6. cannot be factored
7. $x = 1$
8. $x = \frac{5}{3}$ or $\frac{2}{3}$

Lesson 3, pages 118-119
1. $x = 5$ or -5
3. $x^2 + 10x + 25 = 49$
4. $x = 2$ or $x = -12$
5. $x = 4$ or -4
6. $x = -1$
7. $x = 3$ or -3
8. no real solution
9. $x = -1$ or 2
10. $y = \sqrt{5} - 5$
12. $x = 2$ or -8

Lesson 4, pages 120-121
1. $x^2 + 6x = -5$
2. 9
3. $x = -1$ or -5
4. $x = 1$ or -11
5. $y = 6$ or -4
6. $y = 6$ or -2
7. $y = 3$
8. $y = 7$ or 1
9. $y = -7$ or -1
10. $x = -3$

Exploration 4, page 122

1	1	4
2	3	8
3	6	12
4	10	16
10	55	40
100	5050	400
n	$\dfrac{n(n+1)}{2}$	$4n$

Exploration 5, page 122

1	1	6
2	4	18
3	10	36
4	20	60
10	220	330
100	171700	30,300
n	$\dfrac{n(n+1)(n+2)}{6}$	$3n(n+1)$