Chapter 5 BLM Answers

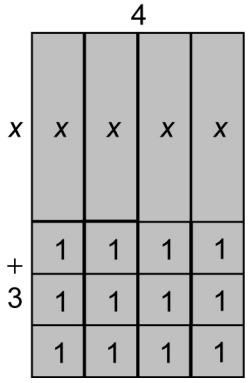
BLM 5-1 Prerequisite Skills

1. a) $-42x$ **b)** $72x$ **c)** $-64x$ **d)** $-16x$

2. a) $-10x^2 + 13x + 3$ **b)** $14x - 21$
c) $3x^2 + 3x + 6$ **d)** $-5x^2 - 3x - 11$

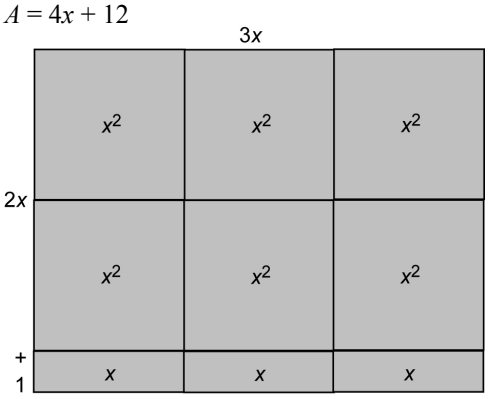
3. a) $7x - 84$ **b)** $-30x^2 - 15x$
c) $12x^2 - 28x$ **d)** $-9x - 18x^2$

4. a)



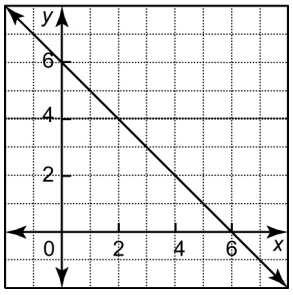
$A = 4x + 12$

b)

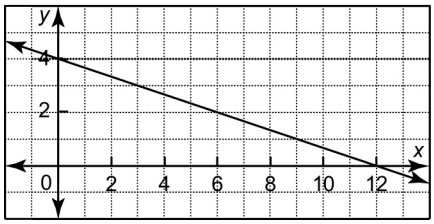


$A = 6x^2 + 3x$

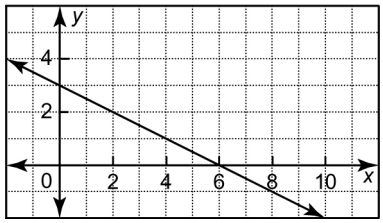
5. a)



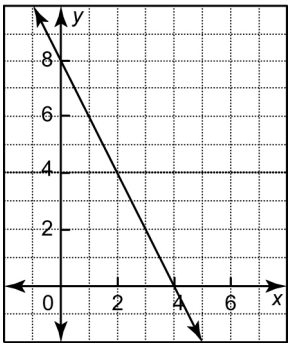
b)



c)

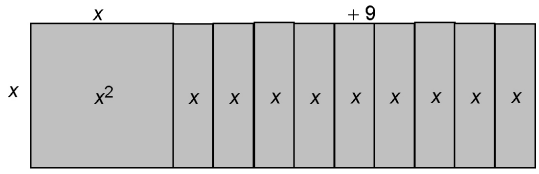


d)

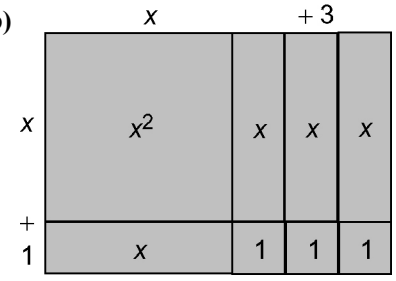


6. a) $x = -3$; $y = 6$
b) $x = 2, -2$; $y = -8$
c) $x = 3, x = -3$; $y = 9$

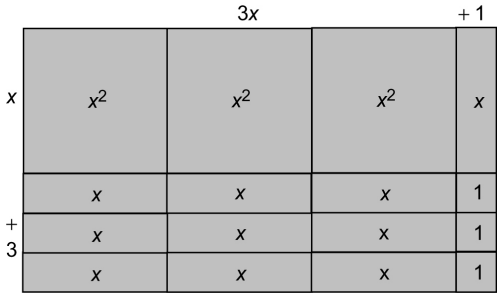
7. a)



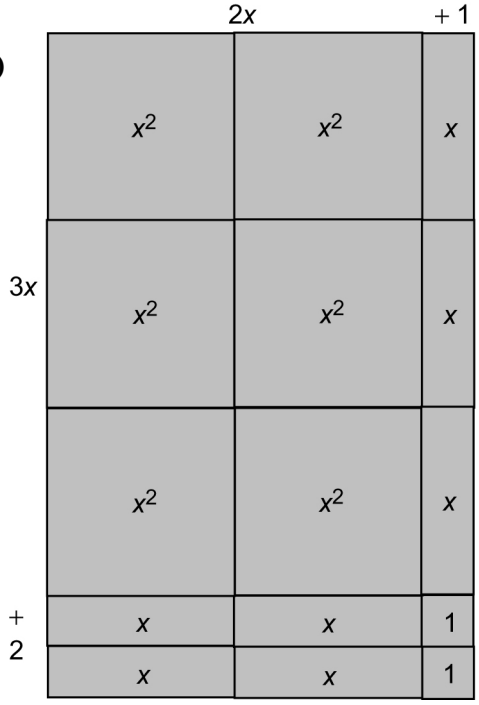
b)



c)



d)



8. a) 70 m^2 **b)** 38 m^2 **c)** 118 m^2 **d)** 187 m^2

9. a) 1, 2, 3, 4, 6, 9, 12, 36
b) 1, 3, 9, 27
c) 1,2, 4, 7, 8, 14, 28, 56
d) 1, 2, 3, 4, 6, 12

10. a) 5, 1 **b)** 3, 4 **c)** –3, 3
d) –6, –1 **e)** –5, 4 **f)** –3, 7

11. a) $x = -3$ **b)** $x = 1$
c) $x = 19$ **d)** $x = 3$

12. a) $3(x^2 + 2)$ **b)** $x(2x + 1)$
c) $4x(x - 7)$ **d)** $-3x(x + 4)$
e) $-x^2(3x + 1)$ **f)** $7x(3x - 5)$
g) $-6(x + 6)$ **h)** $-10(x - 100)$

13. a) $(x - 3)(x + 4)$ **b)** $(x + 7)(x + 1)$
c) $(x - 2)(x - 11)$ **d)** $(x + 4)(x - 1)$
e) $(x - 6)(x + 3)$ **f)** $(x + 1)(x + 1)$

BLM 5-3 Section 5.1 Expand Binomials

1. a) 3, $x + 3$ **b)** $2x$, $x + 1$ **c)** $2x + 2$, $4x + 2$

2. a) $3x + 9$ **b)** $2x^2 + 2x$ **c)** $8x^2 + 12x + 4$

3. a) $3x^2 - 18x$ **b)** $x^2 - 4x - 12$
c) $x^2 - 49$ **d)** $x^2 - 10x - 11$
e) $x^2 + 14x + 49$ **f)** $x^2 - 18x + 81$

4. a) $6x^2 - 11x - 7$ **b)** $16x^2 - 38x - 5$
c) $15x^2 - 4x - 3$ **d)** $6 - 10x - 4x^2$
e) $9x^2 + 6x + 1$ **f)** $4x^2 - 20x + 25$
g) $25x^2 + 30x + 9$ **h)** $81x^2 - 18x + 1$
i) $100x^2 + 60x + 9$ **j)** $121 + 110x + 25x^2$

5. a) $2x^2 + 11x + 12$
b) $2x^2 + 17x + 30$
c) $3x^2 + 19x + 6$

6. a) 88 cm^2 **b)** 130 cm^2 **c)** 130 cm^2

7. a) $3x^2 + 22x + 24$ **b)** 544 m^2

8. a) $4x^2 + 14x + 16$
b) $13x^2 + 8x - 1$
c) $6x + 9$

9. a) 186 cm^2 **b)** 364 cm^2 **c)** 39 cm^2

10. a) $h = -2d^2 + 28d - 80$ **b)** 16 m

11. a) $x^2 + 7x$ **b)** $3x^2$
c) $x^2 + 10x + 24$ **d)** $2x^2 + 4x$

12. a) He is doing the multiplication that would be done in the expansion. By adding 5 and 2, he gets the coefficient of x and by multiplying 5 times 2, he gets the constant of 10.
b) It would not work in this case. The coefficient of x in the first bracket is not 1.

BLM 5-4 Section 5.2 Change Quadratic Relations From Vertex Form to Standard Form

1. a) $y = x^2 - 6x + 9$ **b)** $y = x^2 + 4x + 4$
c) $y = x^2 + 12x + 36$ **d)** $y = x^2 - 10x + 25$

2. a) $y = 2x^2 + 12x + 18$
b) $y = -3x^2 + 30x - 75$
c) $y = 0.5x^2 + 4x + 8$
d) $y = -0.75x^2 + 6x - 12$

3. a) $y = x^2 + 6x + 8$ **b)** $y = x^2 - 4x + 9$
c) $y = x^2 + 2x - 3$ **d)** $y = x^2 - x + 2.25$

4. a) $y = 3x^2 - 12x + 13$ **b)** $y = 0.25x^2 + 2x + 8$
c) $y = -2x^2 + 4x + 2$ **d)** $y = -0.5x^2 - 6x - 15$

5. a) $y = -3x^2 + 24x - 45$
b) $y = 2x^2 + 4x + 7$
c) $y = -0.5x^2 + 2x + 1$
d) $y = 5x^2 + 30x + 49$

6. a) 1 **b)** 2
c) 14 **d)** 36

7. a) $h = -2d^2 + 16d + 1$ **b)** (4, 33)
c) 33 m **d)** 4 m
8. a) $h = -0.38(x - 10)^2 + 40$
b) $h = -0.38x^2 + 7.6x + 2$
c) 2 m
d) 40 m
9. Initial velocity: 49 m/s; initial height: 60.5 m

BLM 5-6 Section 5.3 Factor Trinomials of the Form $x^2 + bx + c$

1. a) 3, 7 **b)** 4, 3
c) –6, 2 **d)** –8, –5
e) 6, 5 **f)** –3, –6
g) 5, 4 **h)** –6, –8
2. a) $(x + 4)(x + 8)$
b) $(x - 6)(x - 3)$
c) $(x + 1)(x - 3)$
d) $(x - 5)(x - 7)$
3. a) $(x - 6)(x + 3)$ **b)** $(x + 1)(x + 1)$
c) $(x + 7)(x - 8)$ **d)** $(x + 9)(x + 6)$
e) $(x - 7)(x + 8)$ **f)** $(x - 15)(x + 3)$
4. a) $(x + 1)(x + 3)$ **b)** $(x + 4)(x + 4)$
c) $(x + 2)(x + 3)$ **d)** $(x + 1)(x + 8)$
5. a) $x(x + 8)$ **b)** $x(x - 16)$
c) $x(x + 0.5)$ **d)** $x(x - 28)$
6. a) $(x + 3)(x - 3)$ **b)** $(x - 4)(x + 4)$
c) $(x - 6)(x + 6)$ **d)** $(x - 2)(x + 2)$
e) $(x - 15)(x + 15)$
f) $(x - 9)(x + 9)$
7. a) $x(x + 36)$ **b)** $(x + 7)(x + 3)$
c) $(x - 10)(x + 10)$ **d)** $(x - 9)(x + 8)$
e) $(x + 8)(x + 4)$ **f)** $x(x + 50)$
g) $(x - 11)(x + 11)$ **h)** $(x - 4)(x + 4)$
8. a) $(x + 7)(x - 3)$ **b)** Not possible
c) $(x + 5)(x + 5)$ **d)** Not possible
e) $(x - 7)(x + 1)$ **f)** Not possible
9. a) $8(x + 3)$ **b)** $\pi(x-3)(x+3)$
10. a) $A = (x + 4)(x + 2)$; 168 cm^2
b) $A = (x - 6)(x - 3)$; 28 cm^2

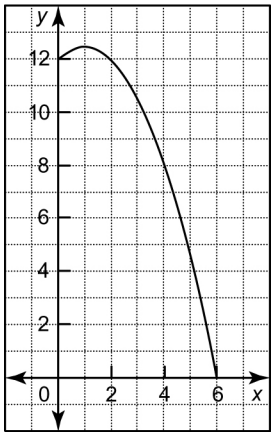
BLM 5-7 Section 5.4 Factor Trinomials of the Form $ax^2 + bx + c$

1. a) $2(x + 3)(x + 4)$ **b)** $4(x - 7)(x + 1)$
c) $5(x - 4)(x - 5)$ **d)** $3(x - 6)(x + 7)$
2. a) $-2(x + 1)(x - 7)$ **b)** $6(x - 8)(x - 9)$
c) $-5(x + 6)(x - 2)$ **d)** $-1.5(x - 4)(x - 1)$
e) $-3.5(x + 2)(x + 6)$ **f)** $0.6(x - 4)(x + 7)$
3. a) $3x(x + 4)$ **b)** $4x(x - 6)$
c) $-7x(x - 2)$ **d)** $-1.5x(x - 5)$
e) $3.6x(x + 6)$
4. a) $5(x + 2)(x - 1)$ **b)** $3(x - 3)(x + 3)$
c) $4x(x - 7)$ **d)** $-6(x - 3)(x + 4)$
e) $-2(x - 2)(x + 2)$ **f)** $-4(x + 7)(x - 2)$
g) $1.5(x - 1)(x + 3)$ **h)** $-5.6(x - 4)(x + 4)$
5. The solutions to the original trinomial and the factored trinomial are the same.
a) $2(x + 5)(x - 6)$; –48
b) $-3(x + 1)(x - 6)$; 36
c) $4(x - 7)(x + 4)$; –56
d) $-0.5(x + 2)(x - 3)$; 0
6. a) $6(x + 4)(x + 3)$ **b)** 1092 cm^3
7. a) $h = -5(t - 3)(t + 1)$ **b)** 15 m
8. a) $SA = \pi r(r + 2h)$ **b)** 330 cm^2

BLM 5-9 Section 5.5 The *x*-Intercepts of a Quadratic Relation

1. a) –2, 3 **b)** 1, 7
2. a) –2, 8 **b)** –5, 5
3. a) 1, –2 **b)** –7, 5 **c)** 0, 6
d) –6, 9 **e)** –8, 2 **f)** 6, –6
4. a) –5, –3 **b)** 4, –2 **c)** 3, –3
d) 6, –2 **e)** 5, –**1** **f)** 2, –2
5. a) –6, 2 **b)** 8, –2
6. Part a) has more than one *x*-intercept. The vertex is above the *x*-axis and the parabola opens downward. Part **b)** has no *x*-intercept because the vertex is above the *x*-axis and the parabola opens upward.
7. a) $y = x^2 + 6x + 8$; $y = (x + 4)(x + 2)$
b) $y = -2x^2 - 4x + 30$; $y = -2(x - 3)(x + 5)$
c) $y = -3x^2 + 75$; $y = -3(x - 5)(x + 5)$
8. a) 12 m
b) $h = -0.5(d - 6)(d + 4)$
c) 6, –4
d) 6 m

e)



9. a) $h = 0.25d(d - 20)$ **b)** 0, 20 **c)** 20 m

BLM 5-11 Section 5.6 Solve Problems Involving Quadratic Relations

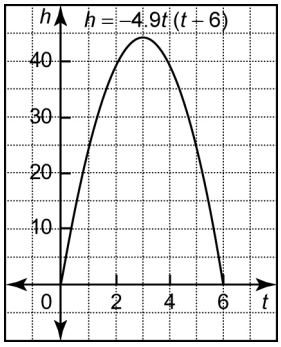
1. a) –6, 4 **b)** –5, –2 **c)** –2, 2 **d)** 6, –12
2. a) $y = (x + 12)(x - 2)$
b) $y = 2(x + 6)(x - 5)$
3. a) 8, 4 **b)** –3, –4 **c)** –1, 5
d) 4, –4 **e)** –6, 4 **f)** –6, 6
4. a) $x = 3$ **b)** $x = -5$
5. a) $x = 5$ **b)** $x = -3$ **c)** $x = 3$ **d)** $x = 4$
6. a) $y = (x - 5)^2 - 1$; $y = x^2 - 10x + 24$
b) $y = 2(x + 3)^2 - 18$; $y = 2x^2 + 12x$
7. a) Length: $10 + 2x$; width: $5 + 2x$
b) $A = 4x^2 + 30x + 50$
c) 2.5 cm
8. 2 cm by 30 cm
9. a) $y = -(x - 5)(x + 1)$
b) 5, –1
c) $y = 5$; the height of the building.
d) 5 m
10. $y = -2x^2 + 4x + 16$
11. a), b) Answers may vary.

BLM 5-13 Chapter 5 Review

1. a) $x^2 + 4x - 12$ **b)** $x^2 - 9$
c) $6x^2 + 5x - 4$ **d)** $4x^2 + 4x + 1$
2. $A = 7x^2 + 39x + 27$
3. a) $y = 3x^2 - 36x + 112$
b) $y = -2x^2 - 4x - 5$
c) $y = 1.5x^2 - 12x + 25$
d) $y = -0.6x^2 - 2.4x - 7.4$
4. a) 112 **b)** –5 **c)** 25 **d)** –7.4
5. a) $y = 3x^2 - 6x + 7$ **b)** $y = -6x^2 + 48x - 86$
6. a) $x(x - 13)$ **b)** $(x + 3)(x - 3)$
c) $(x + 5)(x + 6)$ **d)** $(x - 6)(x + 8)$
e) $(x - 4)(x - 7)$ **f)** $(x + 3)(x + 9)$
g) $-2x(x - 4)$ **h)** $(x + 9)(x + 5)$
7. a) Length: $x + 7$; width: $x + 2$
b) 12 m by 7 m
8. a) $2(x + 6)(x - 4)$ **b)** $-3(x - 7)(x + 1)$
c) $-4(x + 8)(x - 3)$ **d)** $0.5(x + 1)(x - 1)$
e) $-2(x - 9)(x - 3)$ **f)** $10(x - 4)(x + 7)$
9. a) $h = -5(t - 4)(t + 1)$
b) $h = 0$; the balloon hit the ground after 4 s.
10. a) 0, 7 **b)** 3, –3 **c)** –6, 8
11. a) $y = 2x^2 + 4x - 48$; 4, –6
b) $y = -3x^2 + 6x + 45$; 5,–3
12. a) $h = -4.9t(t - 6)$
b)

Time (s)	Height (m)
0.5	13.475
1.0	24.5
1.5	33.075
2.0	39.2
2.5	42.875
3.0	44.1
3.5	42.875

c) 0, 6
d)



e) 6 s
13. a) 4,–6; minimum at $y = -25$
b) 4,–4; minimum at $y = -32$
c) 3, –7, maximum at $y = 75$
d) 5, –3; maximum at $y = 64$
14. a) $A = 6(x - 1)(x + 1)$ **b)** $x = 10$ m
15. a)–c) Answers may vary.

BLM 5-14 Chapter 5 Practice Test

1. C
2. B
3. B
4. D
5. A
6. B
7. D
8. a) $y = -3x^2 - 18x - 42$
b) $y = 0.5x^2 - 2x + 3$
c) $y = 2x^2 - 16x + 36$
9. a) $A = 3(2x + 3)$ **b)** 45 mm^2

10. a) $2(x + 3)(x - 4)$ **b)** $-3(x + 1)(x - 1)$
c) $0.5(x + 7)(x - 4)$ **d)** $-2.5(x - 5)(x + 3)$
e) $-(x - 7)(x - 1)$ **f)** $-2(x - 6)(x + 6)$

11. a) (1, 6) **b)** 6 m
c) 1 s **d)** $h = -5t^2 + 10t + 1$
e) 1 m; the height from which the ball was thrown.

12. a) $A = 4x^2 + 54x + 180$ **b)** 5 m

BLM 5-15 Chapter 5 Test

1. a) T **b)** F **c)** T **d)** T **e)** F
2. C
3. B
4. A
5. B
6. A
7. C
8. a) $A = 6x^2 - 13x - 28$ **b)** 1300 cm^2
9. a) $y = -2x^2 - 12x - 14$
b) $y = 6x^2 - 48x + 108$
10. a) 12, 4 **b)** 7, 3 **c)** –1, 4
11. a) $A = 4(25 - x)(25 + x)$ **b)** 10 cm
12. a) $h = -(d - 4)(d + 1)$ **b)** 4, –1
c) 4 m **d)** 4 m