Chapter 8 BLM Answers

BLM 8–2 Chapter 8 Prerequisite Skills

1. a) $m = -3$, y-intercept = 4

b) $m = \frac{2}{5}$, y-intercept $= -\frac{1}{3}$

c) $m = \frac{3}{2}$, y-intercept $= -\frac{7}{2}$

d) $m = -1.8$, y-intercept = 2.1

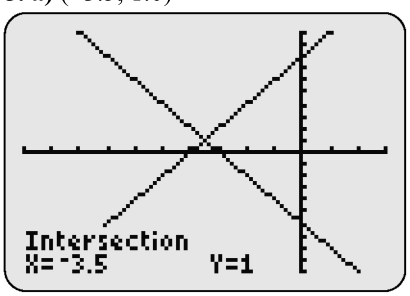
2. a) $y = -2x - 5$ **b)** $y = -\frac{2}{3}x - 2$

3. a) $x + y = 752$, $x - y = 174$ **b)** $a + c = 256$, $5a + 3c = 767$

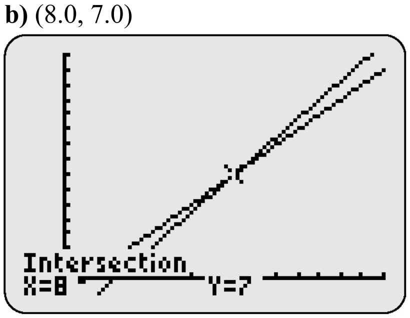
c) $q + l = 73$, $0.25q + l = 37$ **d)** $75 + 15m = C$, $35m = C$

4. a) None. The lines have the same slope, but different y-intercepts, so the lines are parallel.
b) Infinite. The equations are multiples of each other, so the lines are congruent.
c) Infinite. The equations are multiples of each other, so the lines are congruent.
d) One. These are linear equations with different slopes and y-intercepts, so the lines intersect.

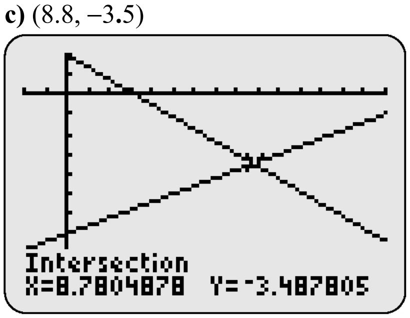
5. a) (–3.5, 1.0)



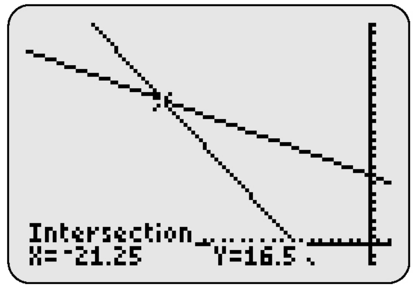
b) (8.0, 7.0)



c) (8.8, –3.5)



d) (–21.3, 16.5)



6. a) (3, 8) **b)** $\left(\frac{2}{9}, -\frac{4}{3}\right)$ **c)** (6.5, 4.5) **d)** (1.5, –1)

7. a) (4, –13) **b)** (1.5, 0) **c)** $\left(\frac{18}{7}, \frac{8}{7}\right)$ **d)** (–5, 2)

BLM 8–3 Chapter 8 Warm-Up

Section 8.1

a) $y = \frac{3}{4}x + 2$; $m = \frac{3}{4}$, $b = 2$

b) $y = -\frac{1}{2}x + 4$; $m = -\frac{1}{2}$, $b = 4$

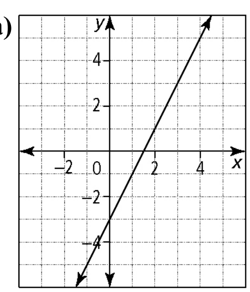
2. a) $y = -\frac{1}{2}x + 5$ **b)** 0

c) Line B, since the line falls as you move to the right
d) (2, 4)
e) Substitute the point (6, 2) into the equation for line B:

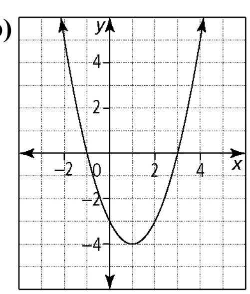
$$2 = -\frac{1}{2}(6) + 5$$
$$2 = -3 + 5$$
$$2 = 2$$

Since both sides are equal after substituting, (6, 2) is on the line.

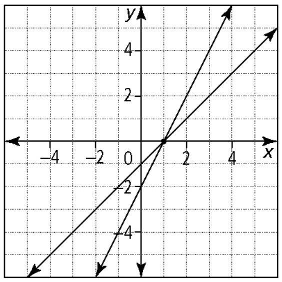
3. a)



b)



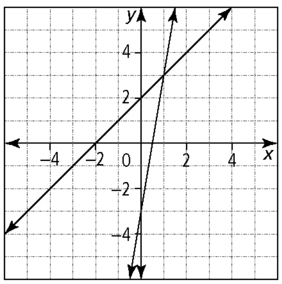
4. a)



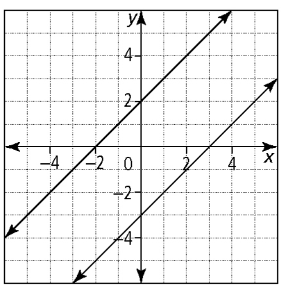
(1, 0)

b) quadrants I, III, and IV

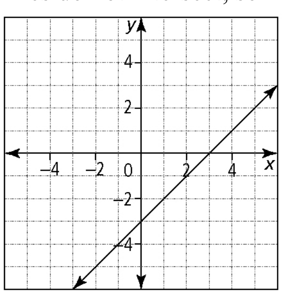
5.



lines intersect, so one solution



lines do not intersect, so no solution



lines fall on top of each other, so infinite number of solutions.

6. a) quadratic **b)** parabola **c)** (3, 4)
d) $x = 3$ **e)** a is negative
f) $x = 1$ and $x = 5$

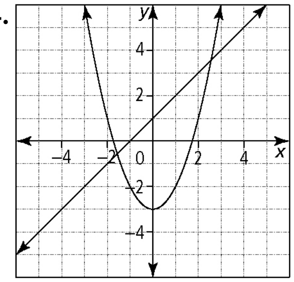
Section 8.2

1. a) $4x - 7$ **b)** $-6s + 4t$ **c)** $8p^2 - 6pq + q^2$
d) $-3x^2 - 14x + 5$ **e)** $-a - 2b$ **f)** $22m - 16p$
g) $9x^2 - 30xy + 25y^2$ **h)** $8x^2 + 40x + 26$

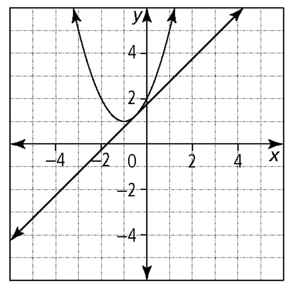
2. a) (−1, 2) **b)** (−3, 2) **c)** (4, −1) **d)** $\left(\frac{21}{33}, -\frac{10}{11}\right)$

3. a) (2, −3) **b)** (3, −1) **c)** (3, 4) **d)** (1, 2)

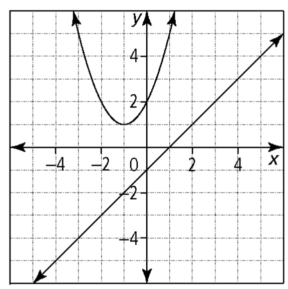
4.



The line crosses the parabola, so there are two solutions.

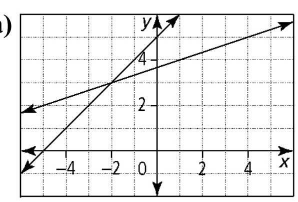


The line is tangent to the parabola, so there is one solution.



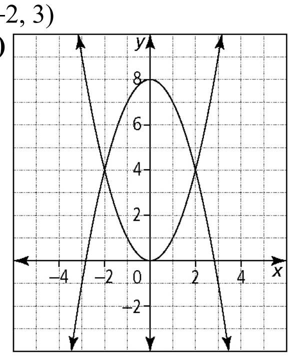
The line does not touch or cross the parabola, so there are no solutions.

5. a)



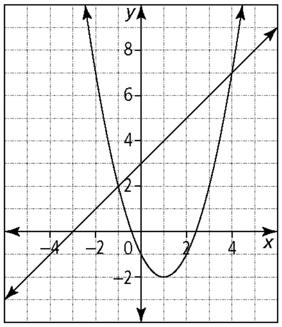
(−2, 3)

b)



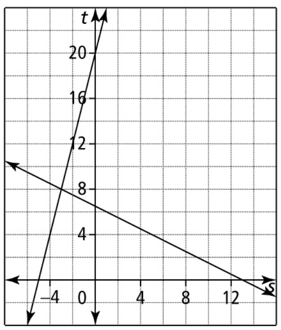
(−2, 4) and (2, 4)

c)



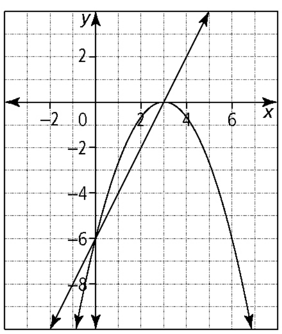
(–1, 2) and (4, 7)

d)



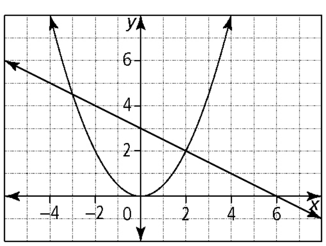
(–3, 8)

e)



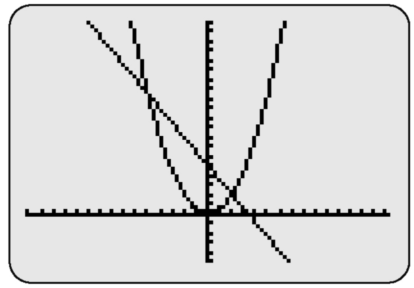
(3, 0) and (0, –6)

f)



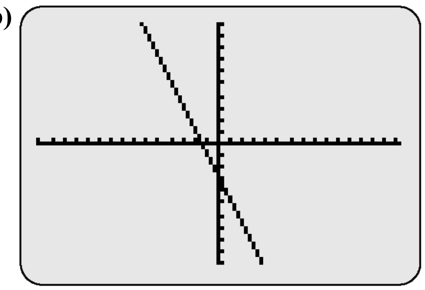
(2, 2) and $\left(-3, \frac{9}{2}\right)$

6. a)



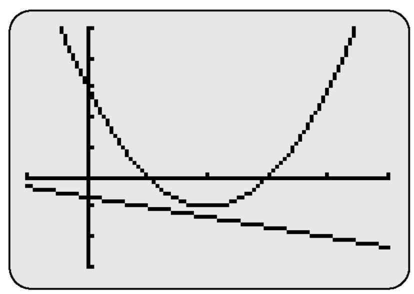
two solutions because there are two intersection points

b)



infinite number of solutions because the two graphs are the same

c)



no solutions, or zero solutions, because the two graphs do not intersect

BLM 8–4 Section 8.1 Extra Practice

1. Point (1, –3):

LS = $x^2 - 4x - y$ RS = 0
= $(1)^2 - 4(1) - (-3)$
= 0
LS = RS

LS = $x - y - 4$ RS = 0
= $1 - (-3) - 4$
= 0
LS = RS

Therefore, point (1, –3) is a solution.

Point (4, 0):

$LS = x^2 - 4x - y \qquad RS = 0$
$\quad = (4)^2 - 4(4) - (0)$
$\quad = 0$

LS = RS

$LS = x - y - 4 \qquad RS = 0$
$\quad = 4 - (0) - 4$
$\quad = 0$

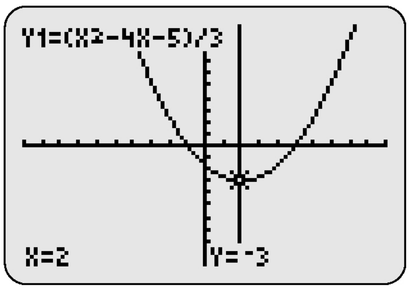
LS = RS

Therefore, point (4, 0) is a solution.

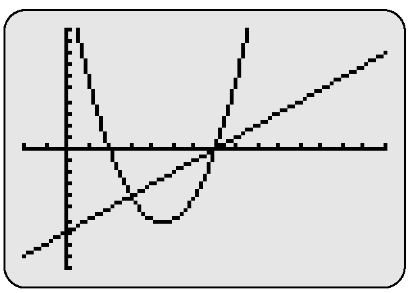
2. a) (–2, –4) and (0, 0);
$y = x^2 + 4x$
$y = -x^2$

b) (–1, 2) and (–4, 8);
$y = 2x^2 + 8x + 8$
$y = -2x$

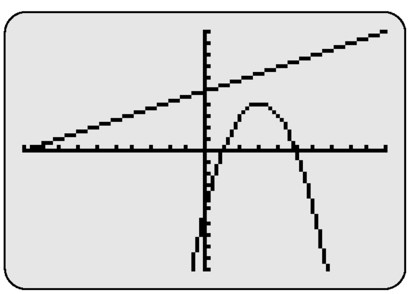
3. a) (2, –3)



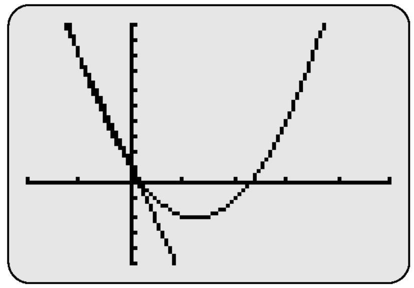
b) (3, –4) and (7, 0)



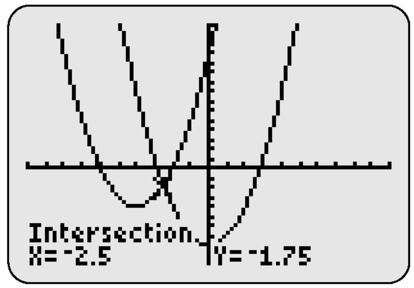
c) no solution



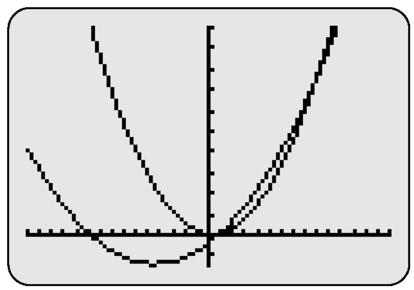
d) (–1, 8) and (0, 1)



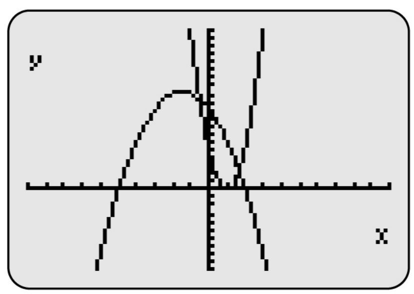
4. a) (–2.50, –1.75)



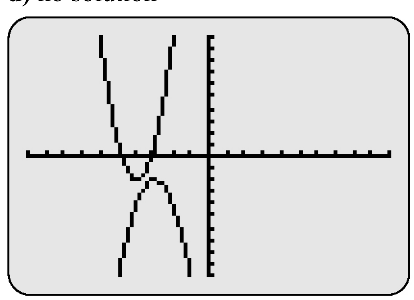
b) (1.00, 2.00) and (9.00, 154.00)



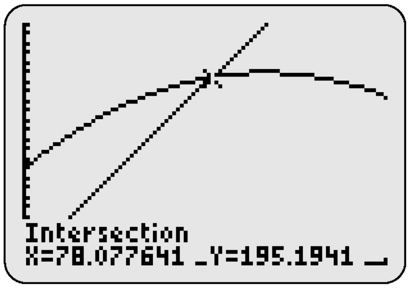
c) (–0.50, 11.25) and (1.67, 2.22)



d) no solution



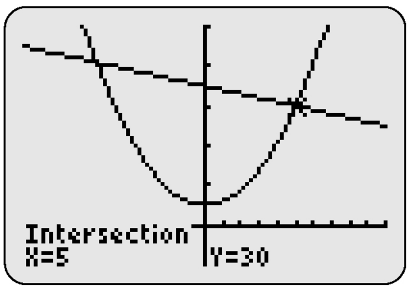
5. 78 items, or \$195



6. a) x = Max's age: $x + y = 35$

y = father's age: $x^2 + 5 = y$

b)



The two solutions to the system are (−6, 41) and (5, 30). (−6, 41) is not meaningful because Max cannot be −6 years old.

c) Max is 5 and his father is 30.

BLM 8–5 Section 8.2 Extra Practice

1. Point (−1, 11):

$$\begin{aligned} LS &= 2x + y & RS &= 9 \\ &= 2(-1) + 11 \\ &= 9 \end{aligned}$$

LS = RS

$$\begin{aligned} LS &= 2x^2 - 4x - y & RS &= -5 \\ &= 2(-1)^2 - 4(-1) - 11 \\ &= -5 \end{aligned}$$

LS = RS

Therefore, (−1, 11) is a solution.

Point (2, 5):

$$\begin{aligned} LS &= 2x + y & RS &= 9 \\ &= 2(2) + 5 \\ &= 9 \end{aligned}$$

LS = RS

$$\begin{aligned} LS &= 2x^2 - 4x - y & RS &= -5 \\ &= 2(2)^2 - 4(2) - 5 \\ &= -5 \end{aligned}$$

LS = RS

Therefore, (2, 5) is a solution.

2. Point (−1, −4):

$$\begin{aligned} LS &= y & RS &= x^2 + 2x - 3 \\ &= -4 & &= (-1)^2 + 2(-1) - 3 \\ & & &= -4 \end{aligned}$$

LS = RS

$$\begin{aligned} LS &= y & RS &= -x^2 - 2x - 5 \\ &= -4 & &= -(-1)^2 - 2(-1) - 5 \\ & & &= -4 \end{aligned}$$

LS = RS

Therefore, (−1, −4) is a solution.

3. a) (3, 7) and (4, 9)

Verify:

Point (3, 7)

$$\begin{aligned} LS &= y & RS &= 2(3) + 1 \\ &= 7 & &= 7 \end{aligned}$$

LS = RS

$$\begin{aligned} LS &= y & RS &= (3)^2 - 5(3) + 13 \\ &= 7 & &= 7 \end{aligned}$$

LS = RS

Therefore, (3, 7) is a solution.

Point (4, 9)

$$\begin{aligned} LS &= y & RS &= 2(4) + 1 \\ &= 9 & &= 9 \end{aligned}$$

LS = RS

$$\begin{aligned} LS &= y & RS &= (4)^2 - 5(4) + 13 \\ &= 9 & &= 9 \end{aligned}$$

LS = RS

Therefore, (4, 9) is a solution.

b) $\left(\frac{-3}{2}, \frac{17}{2}\right)$ and (2, −2)

Verify:

Point $\left(\frac{-3}{2}, \frac{17}{2}\right)$

$$\begin{aligned} LS &= (3)\left(\frac{-3}{2}\right) + \frac{17}{2} - 4 & RS &= 0 \\ &= \frac{-9}{2} + \frac{17}{2} - 4 \\ &= 0 \end{aligned}$$

LS = RS

$$\begin{aligned} LS &= (2)\left(\frac{-3}{2}\right)^2 - (4)\left(\frac{-3}{2}\right) - \left(\frac{17}{2}\right) - 2 & RS &= 0 \\ &= \frac{18}{4} + \frac{24}{4} - \frac{34}{4} - \frac{8}{4} \\ &= 0 \end{aligned}$$

LS = RS

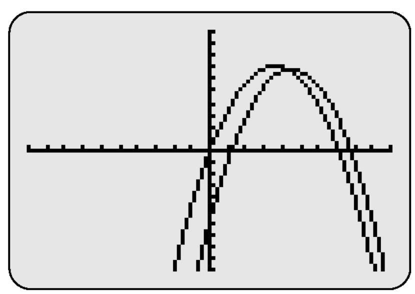
Therefore, $\left(\frac{-3}{2}, \frac{17}{2}\right)$ is a solution.

Point (2, –2):
LS = 3(2) + (–2) – 4 RS = 0
= 0
LS = RS
LS = $2(2)^2 - 4(2) - (-2) - 2$ RS = 0
= 0
LS = RS
Therefore, (2, –2) is a solution.
c) (–4, 10) and (2, 4)
Verify:
Point (–4, 10)
LS = y RS = $-(-4)^2 - 3(-4) + 14$
= 10 = 10
LS = RS
LS = y RS = $3(-4)^2 + 5(-4) - 18$
= 10 = 10
LS = RS
Therefore, (–4, 10) is a solution.
Point (2, 4)
LS = y RS = $-(2)^2 - 3(2) + 14$
= 4 = 4
LS = RS
LS = y RS = $3(2)^2 + 5(2) - 18$
= 4 = 4
LS = RS
Therefore, (2, 4) is a solution.
d) (5, 0) and (–2, 7)
Verify:
Point (5, 0)
LS = 4(5) + 0 + 5 RS = 5^2
= 25 = 25
LS = RS
LS = 5^2 RS = 5(5) + 2(0)
= 25 = 25
LS = RS
Therefore, (5, 0) is a solution.
Point (–2, 7)
LS = 4(–2) + 7 + 5 RS = $(-2)^2$
= 4 = 4
LS = RS
LS = $(-2)^2$ RS = 5(–2) + 2(7)
= 4 = 4
LS = RS
Therefore, (–2, 7) is a solution.

4. a) $\left(-1, \frac{10}{3}\right)$ and $\left(\frac{1}{3}, \frac{26}{9}\right)$ **b)** no solution
c) (0, 2) and (3, 1.5) **d)** $\left(\frac{-1}{4}, \frac{63}{16}\right)$ and (5, 0)
5. a) (3, 18)
b) (–1.62, –0.21) and (0.62, 0.54)
6. a) $k = 7$ **b)** (0, –7)
7. a) $k > -4$ **b)** $k = -4$ **c)** $k < -4$
8. a) $y = -1(x + 4)^2 + 4$ and $y = (x - 1)^2 - 9$
b) (–2, 0) and (–1, –5)
9. a) perimeter: $2(3x) + 2(x + 5) = y$;
area: $(3x)(x + 5) = 3y$
b) (5, 50) and (–2, –6)
c) The only possible solution is (5, 50). You cannot have a negative perimeter or area.
d) $x = 5$; perimeter = 50; area = 150 units^2

BLM 8–6 Chapter 8 Test

1. A **2.** B **3.** B **4.** D **5.** A **6.** {(–5, 8), (0, 3)}
7. Example: An object is released from a launcher on the ground, and a person standing on a platform throws a ball, trying to hit the object with the ball.
8. Example: $ay = a(x^2 + 6x - 5)$, $a \in$ R
9. a) LS = $2x^2 + x - 7$ RS = y
= $2(3)^2 + 3 - 7$ = 14
= 14
LS = RS
LS = $3x + y - 23$ RS = 0
= 3(3) + 14 – 23
= 0
LS = RS
b) (–5, 38)
10. $\left\{\left(-\frac{5}{2}, -2\right), \left(\frac{1}{2}, 1\right)\right\}$
11. a) $m = 5$, $k = 2$ **b)** $k = 8$, $m = 2$
12. a) two **b)** $k = 4$ or $k = 0$
c) (5.43, 1.08) or (–1.43, 1.08)
13. a)



{(4.3, 6.8), (21.7, –177.3)}
b) The coordinates represent where the two streams of water meet. However, only the (4.3, 6.8) solution makes sense because the distance cannot be negative in this context.
14. a) perimeter: $2y = 4x - 26$;
area: $3y - 9 = x^2 - 13x + 36$
b) $x = 7$ and $y = 1$, or $x = 12$ and $y = 11$
c) Substituting 7 results in a negative dimension, so x must be 12. The dimensions are 8 units and 3 units.
d) perimeter: 22 units; area: 24 square units