Chapter 9 BLM Answers

BLM 9–2 Chapter 9 Prerequisite Skills

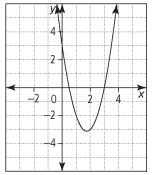
1. a) domain: $\{x \mid x \in \mathrm{R}\}$; range: $\{y \mid y \in \mathrm{R}\}$
b) domain: $\{y \mid y \in \mathrm{R}\}$; range: $\{y \mid y \le 18, y \in \mathrm{R}\}$

2. a) $m = -6$, $b = 2$ **b)** $m = -\frac{1}{2}$, $b = -3$
c) $m = 0.75$, $b = 1.2$ **d)** $m = -\frac{5}{2}$, $b = \frac{3}{2}$

3. a) $y = 2x - 3$ **b)** $y = -x - 5$
c) $y = 3$ **d)** $y = -\frac{2}{3}x + 1$

4. a) $y = 4x - 19$ **b)** $y = -3x + 7$
c) $y = 2x$ **d)** $y = -\frac{3}{4}x + 3$

5.



a) (1.75, –3.125) **b)** $x = 1.75$
c) up **d)** minimum: –3.125
e) domain: $\{x \mid x \in \mathrm{R}\}$, range: $\{y \mid y \ge -3.125, y \in \mathrm{R}\}$
f) (0.5, 0), (3, 0) **g)** (0, 3)

6. a) $(4x - 9)(x - 1)$ **b)** $\frac{1}{2}(x - 4)(x + 1)$
c) $(5p - 2)(p + 3)$ **d)** $(3v + 10)(v + 2)$

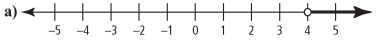
7. a) $-\frac{5}{3}$ and 1 **b)** $\frac{2+\sqrt{7}}{3}$ and $\frac{2-\sqrt{7}}{3}$
c) $-\frac{9}{5}$ **d)** $-\frac{1}{2}$ and 3

BLM 9–3 Chapter 9 Warm-Up

Section 9.1

1. a) $x \ge -2$ **b)** $x \le 1$ **c)** $x < 3$

2. a)

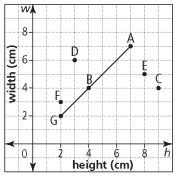


b)

3. a) $m = 3$ **b)** $x = -3$ **c)** $w = -7$ **d)** $y = 3$
4. a) i) $b = 20$ **ii)** $b < 20$ **iii)** $b > 20$
b) i) $b = 15$ **ii)** $b < 15$ **iii)** $b > 15$
c) i) $b = 6$ **ii)** $b < 6$ **iii)** $b > 6$
d) i) $b = -40$ **ii)** $b > -40$ **iii)** $b < -40$

5. a) x-intercept: 2; y-intercept: 5
b) x-intercept: $\frac{3}{2}$; y-intercept: –3
c) x-intercept: $\frac{9}{2}$; y-intercept: 3

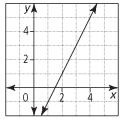
6. a) portrait: $h > w$; square: $h = w$; landscape: $h < w$
b) A: square; B: square; C: portrait; D: landscape; E: portrait; F: landscape; G: square
c)



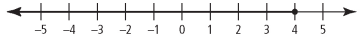
Landscape photos are above the line; portrait photos are below the line.

Section 9.2

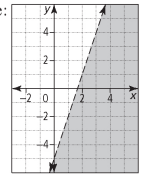
1. Example: A straight line on a graph divides the Cartesian plane into the following three regions: points on the line represent the equation $y = 2x - 3$, points to the left or above the line represent the inequality $y > 2x - 3$, and points to the right or below the line represent the inequality $y < 2x - 3$.



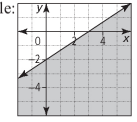
2. a) Example:



b) Example:



c) Example:



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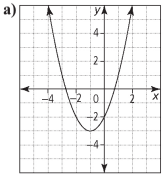
3. a) no **b)** yes **c)** yes
4. a) 17 **b)** 8.29 **c)** ± 2
d) ± 1.2 **e)** Example: (3, 10)
5. a) $(x + 3)(x - 10)$ **b)** $(x + 6)(x + 3)$
c) $(2x + 3)(x - 2)$ **d)** $(3x - 1)(x + 5)$
6. a) 1 and 4 **b)** 5 and –2
c) 8 and –7 **d)** $\frac{1}{2}$ and –1

Section 9.3

1. a) $x = \pm 3$ **b)** $x = 7$ or $x = -1$
c) $x = -\frac{3}{2}$ or $x = -5$ **d)** $x = \frac{2}{3}$ or $x = 1$

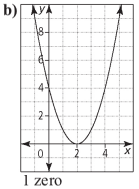
2. $x = \frac{-3 \pm \sqrt{17}}{4}$

3. a)



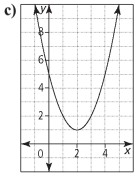
2 zeros

b)



1 zero

c)

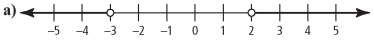


no zeros

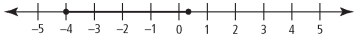
4. Example: The solutions to a quadratic equation are the roots of the equation. You can find the roots by determining the x-intercepts of the graph or by determining the zeros of the quadratic function. For example, when you graph the quadratic function $f(x) = 2x^2 + 2x - 12$, the x-intercepts are –3 and 2. The zeros of the function occur when $f(x) = 0$, so they are –3 and 2. Therefore, the roots of the corresponding equation, $y = 2x^2 + 2x - 12$, are –3 and 2.

5. a) $-1 \le x \le 1$ **b)** $x < -1$ or $x > 1$ **c)** $-1 \le x \le 4$

6. a)



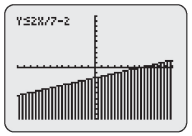
b)



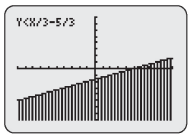
BLM 9–4 Section 9.1 Extra Practice

1. a) B and C **b)** D **c)** A, B, C, and D

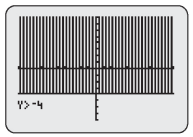
2. a) i) $y \le \frac{2}{7}x - 2$, $m = \frac{2}{7}$, y-intercept: –2
ii) solid line
iii)



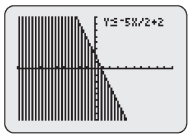
b) i) $y < \frac{1}{3}x - \frac{5}{3}$, $m = \frac{1}{3}$, y-intercept: $-\frac{5}{3}$
ii) broken line
iii)



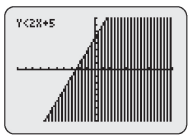
c) i) $y > -4$, $m = 0$, y-intercept: –4
ii) broken line
iii)



d) i) $y \le -\frac{5}{2}x + 2$, $m = -\frac{5}{2}$, y-intercept: 2
ii) solid line
iii)



3. a) i) x-intercept: $-\frac{5}{2}$, y-intercept: 5
ii) broken line
iii)



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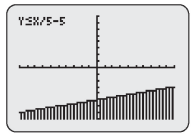
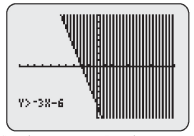
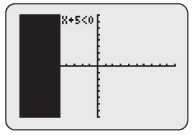
b) i) x-intercept: 25, y-intercept: -5
ii) solid line
iii)



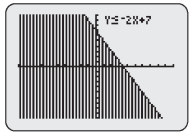
c) i) x-intercept: -2, y-intercept: -6
ii) broken line
iii)



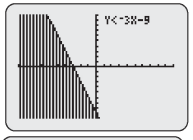
d) i) x-intercept: -5, y-intercept: none
ii) broken line
iii)



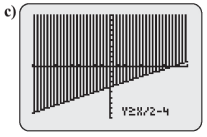
4. a)



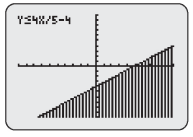
b)



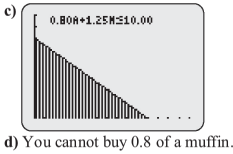
c)



d)



5. a) $0.80a + 1.25m \leq 10.00$, where a is the number of apples and m is the number of muffins
b) The number of apples and the number of muffins must be an integer greater than or equal to zero, or $\{a \mid a \geq 0, a \in I\}$ and $\{m \mid m \geq 0, m \in I\}$.
c)



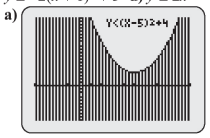
d) You cannot buy 0.8 of a muffin.
6. a) $y \leq \frac{1}{2}x + 2$ **b)** $y \geq 1$ **c)** $y < -2x - 3$

BLM 9–5 Section 9.2 Extra Practice

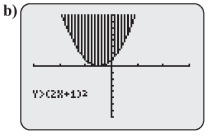
1. a) $x = 1, x = -7$ **b)** $x < -7$ or $x > 1$ **c)** $-7 < x < 1$
2. a) $-2, -3$ **b)** $-3 < x < -2$ **c)** $x < -3$ or $x > -2$
3. a) yes **b)** yes **c)** no **d)** yes
4. a) $x < -5$ or $x > 1$ **b)** $-1 \leq x \leq 3$
c) $-1 \leq x \leq \frac{3}{2}$ **d)** $1 - \sqrt{3} \leq x \leq 1 + \sqrt{3}$
5. a) $x < 2$ or $x > \frac{9}{4}$ **b)** $-\frac{5}{4} \leq x \leq \frac{3}{2}$
c) no solution **d)** $x = \frac{3}{2}$
6. a) $2 - \sqrt{7} < x < 2 + \sqrt{7}$ **b)** $\frac{3 - \sqrt{29}}{2} \leq x \leq \frac{3 + \sqrt{29}}{2}$
c) $x \leq -2 - \sqrt{10}$ or $x \geq -2 + \sqrt{10}$
d) $\frac{-11 - \sqrt{93}}{2} \leq x \leq \frac{-11 + \sqrt{93}}{2}$
7. a) $x = 0$ or $x = -6$ **b)** $x < -6$ or $x > 0$
c) $-5 \leq x \leq -1$

BLM 9–6 Section 9.3 Extra Practice

1. a) B and D **b)** A and B **c)** B and C **d)** B and C
2. a) $y \leq (x - 3)(x + 2)$ **b)** $y \geq x^2 + 8x + 12$
c) $y \leq -2(x + 1)^2 + 5$ **d)** $y \geq 2x^2 - 3x + 4$
3. a)



b)



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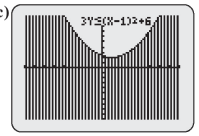
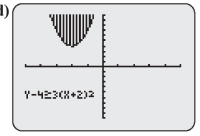
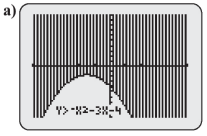
c)



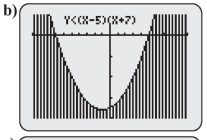
d)



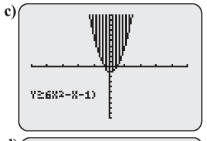
4. a)



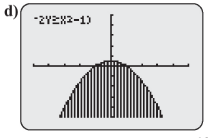
b)



c)



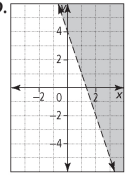
d)



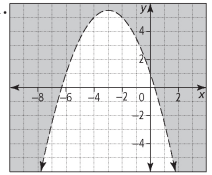
5. $10x^2 + 9y - 90 < 0$ or $y < -\frac{10}{9}x^2 + 10$

BLM 9–7 Chapter 9 Test

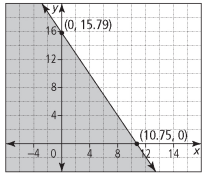
1. B **2.** D **3.** D **4.** C **5.** A
6. Example: When the point is substituted into the inequality, it makes a true statement. Shade the half-plane containing the point.
7. Example: The point (0, 0) lies on the boundary. It cannot be used to determine the solution half-plane.
8. Example: For a quadratic inequality in one variable, the solution contains only x-values or is an interval of x-values. For a quadratic inequality in two variables, the solution is a shaded region on the graph.
9.



Example: Test point (2, 2):
$2 > -3(2) + 4$
$2 > -2$
The test point satisfies the inequality, so the half-plane to the right of the boundary should be shaded.
10. $\{x \mid -\sqrt{2} - 3 \leq x \leq \sqrt{2} - 3, x \in R\}$
11.



Example: Test point (0, 3):
$3 > -\frac{1}{2}(0)^2 - 3(0) + 1$
$3 > 1$
The test point satisfies the inequality, so the region above the parabola should be shaded.
12. a) $13.95x + 9.50y \leq 150$, where x is the number of tickets for adults and y is the number of tickets for children
b)



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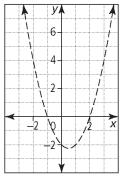
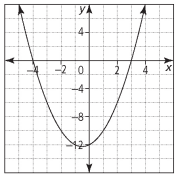
c) Example: The number of tickets must be a whole number. The number of tickets can be various combinations of 0 to 10 adult tickets and 0 to 15 children's tickets, where the total cost does not go over $150.

13. a) Example: $x^2 - x - 2 < 0$



b) Example: $x^2 + x - 12 \geq 0$



14. $\{P \mid 30 < P < 70, P \in \mathrm{R}\}$

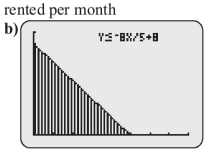
BLM U4–3 Unit 4 Test

1. C **2.** B **3.** C **4.** A **5.** B

6. 2.4 **7.** $\frac{5}{4}$ or 1.25 **8.** 5

9. a) $5m + 8v \leq 40$, where m is the number of movies rented per month and v is the number of video games rented per month

b)



c) Example: The number of movies or games must be whole numbers. The number of movies rented must be fewer than or equal to 8 and the number of video games rented must be fewer than or equal to 5.

10. a) (2, 1) and (5, 4)

b) Example: The x-coordinate is halfway between 2 and 5, so it is 3.5. Substitute this value into the quadratic equation to determine the y-coordinate to be 6.625. So, the coordinates of vertex C are (3.5, 7).

11. Solutions should include one of the following strategies: case analysis, roots and test points, or sign analysis. $\{x \mid \frac{2}{3} < x < \frac{5}{2}, x \in \mathrm{R}\}$

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