

Gr 11 Ch 3 Answers:

BLM 3-2 Chapter 3 Prerequisite Skills

1. a) $8x^2 - 4x$ b) $4x^2 + 25x - 21$
 c) $4x^2 - 20x + 25$ d) $-x^2 + 3x + 13$

2. a) -3 b) $m = \frac{3}{2}$ c) $y = \frac{3}{2}x - 3$

d) all real numbers or $\{y \mid y \in \mathbb{R}\}$ e) 2

3. Example: $(14, -1.2), (19, -3.2)$

4. a) $3x + 4y - 8 = 0$ b) $2x + y + 2 = 0$

5. a) $y = -3x + 4; m = -3; y\text{-intercept} = 4$

b) $y = \frac{3}{7}x - \frac{1}{7}; m = \frac{3}{7}; y\text{-intercept} = -\frac{1}{7}$

c) $y = \frac{3}{4}x; m = \frac{3}{4}; y\text{-intercept} = 0$

6. a) $5x + y - 2 = 0; A = 5, B = 1, C = -2$

b) $-2x + 3y + 21 = 0; A = -2, B = 3, C = 21$

c) $3x - 16y - 4 = 0; A = 3, B = -16, C = -4$

7. a) Label the horizontal axis x and the vertical axis $g(x)$. b) -14

c) Yes. If you substitute $x = 5$, you get $g(5) = 7$.

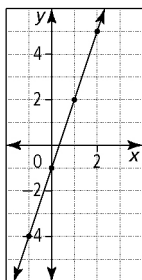
d) g is the set of all real numbers

8. a) 9 b) $\frac{81}{4}$ c) $\frac{49}{16}$

9. a) 1 b) 3 c) 2

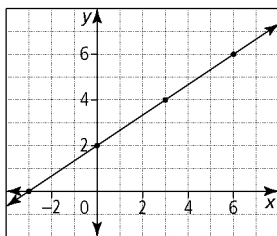
10. a) The y -intercept could have a value of -1 .

x	-1	0	1	2	3
y	-4	-1	2	5	8

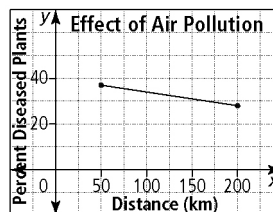


b) The y -intercept could have a value of 2.

x	-3	0	3	6	7
y	0	2	4	6	$\frac{20}{3}$



11. a)



b) $p(50) = 37; p(150) = 31; p(200) = 28$

c) $\{p(x) \mid 28 \leq p(x) \leq 37\}$

BLM 3–4 Section 3.1 Extra Practice

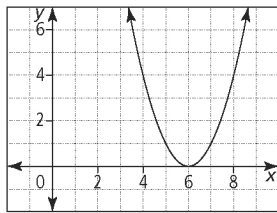
1. a) The graph can be obtained by applying a change in width about the x -axis by a factor of 3. The graph opens upward, has a minimum y -value of 0, and the range is $y \geq 0$.

b) The graph can be obtained by applying a change in width about the x -axis by a factor of 5, and then a reflection in the x -axis. The graph opens downward, has a maximum y -value of 0, and the range is $y \leq 0$.

c) The graph can be obtained by applying a vertical translation up 8 units. The graph opens upward, has a minimum y -value of 8, and the range is $y \geq 8$.

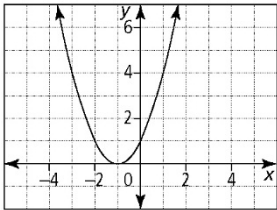
d) The graph can be obtained by applying a vertical translation down 5 units. The graph opens upward, has a minimum y -value of -5 , and the range is $y \geq -5$.

2. a) The graph of $y = (x - 6)^2$ can be obtained from $y = x^2$ by applying a horizontal translation 6 units to the right.



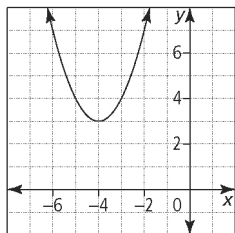
vertex: $(6, 0)$; axis of symmetry: $x = 6$;
domain: $x \in \mathbf{R}$; range: $y \geq 0$; x-intercept: $x = 6$;
y-intercept: $y = 36$

b) The graph of $y = (x + 1)^2$ can be obtained by applying a horizontal translation 1 unit to the left.



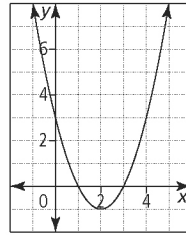
vertex: $(-1, 0)$; axis of symmetry: $x = -1$;
domain: $x \in \mathbf{R}$; range: $y \geq 0$; x-intercept: $x = -1$;
y-intercept: $y = 1$

c) The graph of $y = (x + 4)^2 + 3$ can be obtained by applying a horizontal translation 4 units to the left and a vertical translation 3 units up.



vertex: $(-4, 3)$; axis of symmetry: $x = -4$;
domain: $x \in \mathbf{R}$; range: $y \geq 3$; x-intercept: none;
y-intercept: $y = 19$

d) The graph of $y = (x - 2)^2 - 1$ can be obtained by applying a horizontal translation 2 units to the right and a vertical translation 1 unit down.



vertex: $(2, -1)$; axis of symmetry: $x = 2$;
domain: $x \in \mathbf{R}$; range: $y \geq -1$; x-intercepts: $x = 1$
and 3 ; y-intercept: $y = 3$

3. a) $y = 0.5x^2$ b) $y = -0.5x^2$
c) $y = 0.5(x + 6)^2$ d) $y = 0.5x^2 - 3$

4. a) The graph can be obtained from the graph of $f(x) = x^2$ by applying a horizontal translation 7 units to the left, and a vertical translation 3 units down.

b) The graph can be obtained from the graph of $f(x) = x^2$ by applying a change in width about the x -axis by a factor of 2, a reflection in the x -axis, and a vertical translation 5 units up.

c) The graph can be obtained from the graph of $f(x) = x^2$ by applying a change in width about the x -axis by a factor of $\frac{1}{3}$, a reflection in the x -axis, and a horizontal translation 3 units to the right.

d) The graph can be obtained from the graph of $f(x) = x^2$ by applying a change in width about the x -axis by a factor of 4, a horizontal translation 2 units to the left, and a vertical translation 1 unit down.

5.

	a)	b)	c)	d)
Vertex	$(5, 1)$	$(-2, 0)$	$(-4, -5)$	$(0, 3)$
Axis of symmetry	$x = 5$	$x = -2$	$x = -4$	$x = 0$
Direction	upward	downward	upward	downward
Max/min	min $y = 1$	max $y = 0$	min $y = -5$	max $y = 3$
Domain	$x \in \mathbf{R}$	$x \in \mathbf{R}$	$x \in \mathbf{R}$	$x \in \mathbf{R}$
Range	$y \geq 1$	$y \leq 0$	$y \geq -5$	$y \leq 3$
Number of x-intercepts	0	1	2	2

6. a) $y = 3(x - 2)^2$ b) $y = -2(x + 2)^2 + 3$

c) $y = \frac{1}{2}(x - 3)^2 - 2$ d) $y = -1(x - 4)^2 + 1$

7. a) $f(x) = -2(x - 5)^2$ b) $f(x) = \frac{2}{3}(x - 2)^2 - 6$

BLM 3–5 Section 3.2 Extra Practice

1. a) Yes. The function fits the standard form of a quadratic function with $a = 1$, $b = -15$, and $c = 0$.

b) $y = x^2 - 16$ Yes. The function fits the standard form of a quadratic function with $a = 1$, $b = 0$, and $c = -16$.

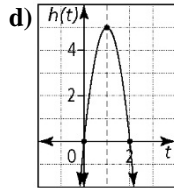
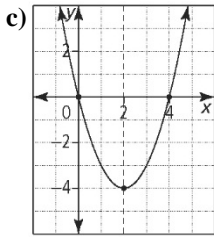
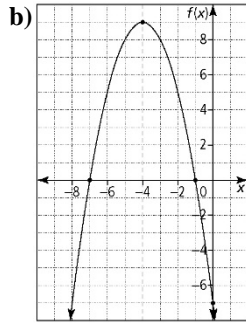
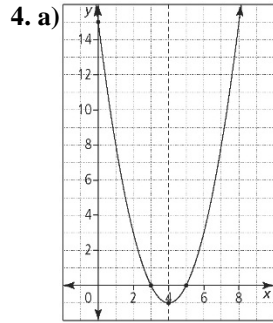
c) Yes. The function fits the standard form of a quadratic function with $a = -4.9$, $b = 0$, and $c = 400$.

d) No. The function does not fit the standard form of a quadratic function.

	a)	b)
Vertex	$(-1, -4)$	$(-1, 9)$
Axis of symmetry	$x = -1$	$x = -1$
x-intercepts	-3 and 1	-4 and 2
y-intercept	-3	8
Direction	upward	downward

Max/min	min $y = -4$	max $y = 9$
Domain	$x \in \mathbb{R}$	$x \in \mathbb{R}$
Range	$y \geq -4$	$y \leq 9$

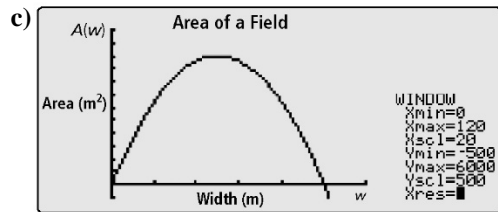
3. a) $y = x^2 + 14x + 39$ b) $f(x) = -6x^2 - 3x + 30$
 c) $h(t) = -9t^2 - 18t + 41$ d) $y = 8x^2 + 26x + 15$



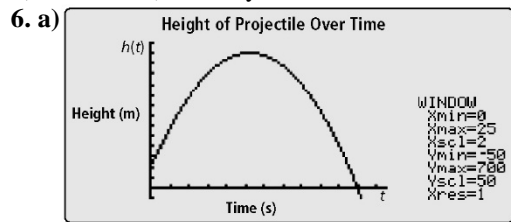
	a)	b)	c)	d)
Vertex	(4, -1)	(-4, 9)	(2, -4)	(1, 5)
Axis of symmetry	$x = 4$	$x = -4$	$x = 2$	$t = 1$
x-intercepts	3 and 5	-1 and -7	0 and 4	0 and 2
y-intercept	15	-7	0	0
Direction	upward	downward	upward	downward
Max/min	min: -1	max: 9	min: -4	max: 5
Domain	$x \in \mathbb{R}$	$x \in \mathbb{R}$	$x \in \mathbb{R}$	$t \in \mathbb{R}$
Range	$y \geq -1$	$f(x) \leq 9$	$y \geq -4$	$h(t) \leq 5$

5. a) $w =$ width; $2 \text{ width} + \text{length} = 200 \text{ m}$ of fencing, so length = $200 - 2w$

b) $A(w) = w(200 - 2w)$ or $A(w) = -2w^2 + 200w$



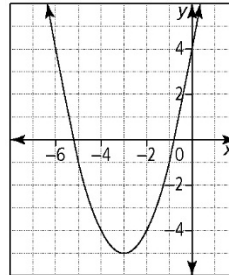
- d) 5000 m^2 e) 50 m by 100 m



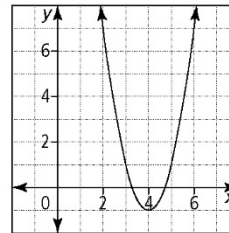
- b) 100 m ; this represents the initial height of the projectile
 c) 21.9 s ; this represents the time that the projectile is in the air
 d) 651.25 m ; occurs at 10.5 s

BLM 3-6 Section 3.3 Extra Practice

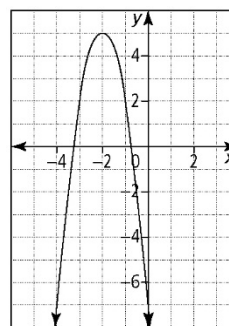
1. a) $25; (x - 5)^2$ b) $16; (x + 4)^2$ c) $36; (x - 6)^2$
 d) $1; (x + 1)^2$
 2. a) $y = (x + 1)^2 - 5; (-1, -5)$
 b) $y = (x - 3)^2 + 4; (3, 4)$
 c) $y = (x + 4)^2 - 10; (-4, -10)$
 d) $y = (x + 12)^2 - 90; (-12, -90)$
 3. a) $y = 3(x - 2)^2 + 1$ b) $y = -2(x + 5)^2 - 6$
 c) $y = 6(x - 4)^2 - 96$ d) $y = -4(x + 7)^2$
 4. a) $y = (x + 3)^2 - 5$; min of -5 when $x = -3$



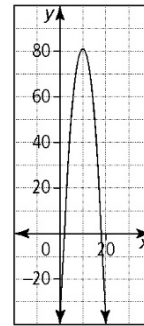
- b) $y = 2(x - 4)^2 - 1$; min of -1 when $x = 4$



- c) $y = -3(x + 2)^2 + 5$; max of 5 when $x = -2$



- d) $y = -1(x - 9)^2 + 81$; max of 81 when $x = 9$



5.

	a)	b)	c)	d)
Vertex	(-5, -9)	(-1, 6)	(-7.5, 4.5)	$(\frac{1}{3}, \frac{2}{3})$
Axis of symmetry	$x = -5$	$x = -1$	$x = -7.5$	$x = \frac{1}{3}$
Max/min	min $y = -9$	max $y = 6$	min $y = 4.5$	min $y = \frac{2}{3}$
Domain	$x \in \mathbb{R}$	$x \in \mathbb{R}$	$x \in \mathbb{R}$	$x \in \mathbb{R}$
Range	$y \geq -9$	$y \leq 6$	$y \geq 4.5$	$y \geq \frac{2}{3}$

6. a) $R(x) = (1200 + 100x)(6.00 - 0.30x)$

b) 4 weeks; \$7680

c) Example that yield increases will remain constant at 100 bushels per week; assume price will decrease at 30¢ each week.

