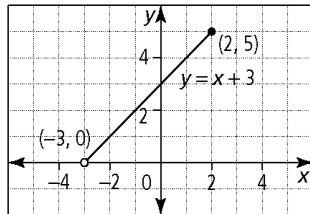


# Chapter 2 BLM Answers

## BLM 2-1 Prerequisite Skills

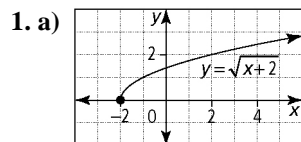
1. a)  $\sqrt[3]{x^2}$  b)  $3\sqrt{5}$  c)  $\frac{1}{48\sqrt{6}} = \frac{\sqrt{6}}{288}$  d)  $\sqrt{g^3}$
2. a)  $x^{\frac{5}{2}}$  b)  $x$  c)  $(xy)^{\frac{2}{3}}$  d)  $a^3by^2(xy)^{\frac{1}{2}}$
3. a)  $\sqrt{54}$  b)  $\sqrt[3]{250}$  c)  $-\sqrt{80}$
4. a)  $2\sqrt{10}$  b)  $a\sqrt[3]{18}$  c)  $-5b^4\sqrt{3b}$  d)  $3x^3y^2\sqrt[3]{2}$
5. a) 15 b) 5 c) 70 d) 20
6. a)  $3\sqrt{2}$  b)  $-6x^4$  c)  $97 - 56\sqrt{3}$  d)  $3x + \sqrt{xy} - 10y$
7. a)  $x \geq 0$  b)  $x \geq 4$  c)  $x > -2$  and  $x \neq 0$  d)  $z \geq 0$
- e)  $x \geq -\frac{1}{3}$  f)  $d \geq 1$
8. a) False;  $\sqrt{25} = 5$  b) False;  $(-3)^2 = 9$
- c) False;  $-2^2 = -4$
9. a)  $x = \frac{16}{3}$  b)  $x = 6$  c)  $x \in \mathbb{R}$  d)  $y = 8$  or  $y = -3$
10. a) domain:  $[-1, 2)$ ; range:  $[-3, 4)$
- b) domain:  $[0, \infty)$ ; range:  $[0, \infty)$
11. a)  $[-2, \infty)$  b)  $(-5, 3]$  c)  $\{x \mid 1.4 \leq x \leq 6, x \in \mathbb{R}\}$
- d)  $\{x \mid x \leq 4, x \in \mathbb{R}\}$

12. Example:

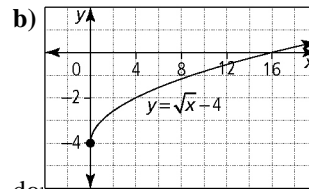


13. a)  $n = \frac{12}{11}$  b)  $n = -1, \frac{3}{2}$  c)  $2 \pm \sqrt{10}$

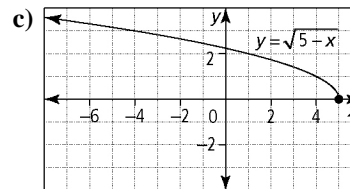
## BLM 2-2 Section 2.1 Extra Practice



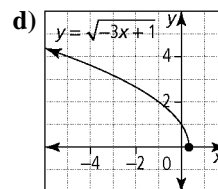
domain:  $\{x \mid x \geq -2, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \geq 0, y \in \mathbb{R}\}$



domain:  $\{x \mid x \geq 4, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \geq 0, y \in \mathbb{R}\}$



domain:  $\{x \mid x \leq 5, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \geq 0, y \in \mathbb{R}\}$



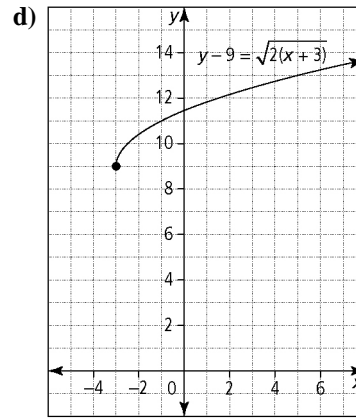
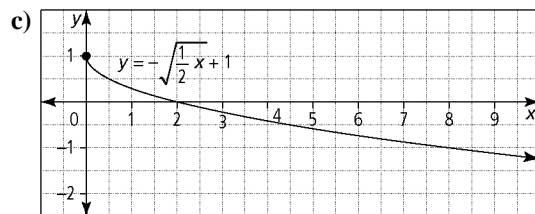
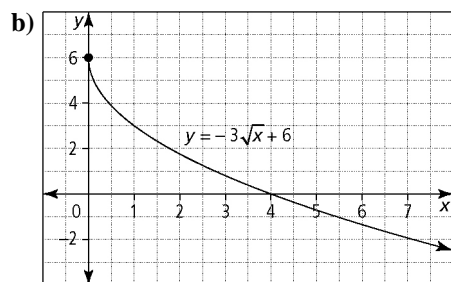
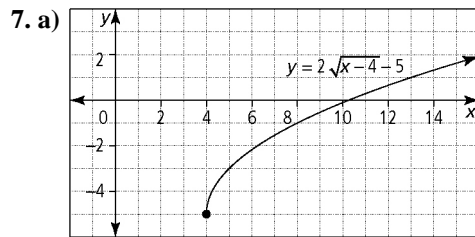
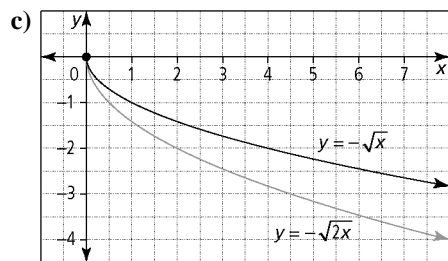
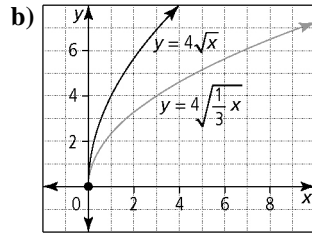
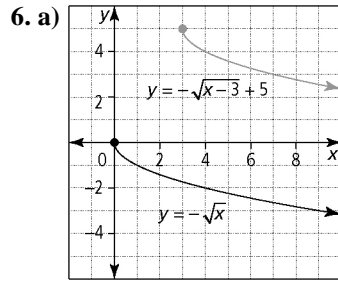
domain:  $\{x \mid x \leq \frac{1}{3}, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \geq 0, y \in \mathbb{R}\}$

2. a) vertical stretch by a factor of 3, translation right 5 units; domain:  $\{x \mid x \geq 5, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \geq 0, y \in \mathbb{R}\}$
- b) vertical reflection in the  $x$ -axis, translation up 7 units; domain:  $\{x \mid x \geq 0, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \leq 7, y \in \mathbb{R}\}$
- c) vertical stretch by a factor of 0.25, horizontal stretch by a factor of 4, translation down 3 units; domain:  $\{x \mid x \geq 0, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \geq -3, y \in \mathbb{R}\}$
- d) horizontal reflection in the  $y$ -axis, translation left 1 unit, translation down 5 units; domain:  $\{x \mid x \leq -1, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \geq -5, y \in \mathbb{R}\}$
3. a) D b) A c) C d) B

4. a)  $y = 3\sqrt{0.5x}$  b)  $y = \sqrt{-(x+2)} + 3$

c)  $y = -\sqrt{3x-7}$  d)  $y = 5\sqrt{4(x-6)}$

5. a) vertical stretch by a factor of 5, translation down 2 units, translation left 7 units
- b) vertical stretch by a factor of 4, reflection in the  $x$ -axis, reflection in the  $y$ -axis, translation up 8 units
- c) horizontal stretch by a factor of 4, translation right 1 unit
- d) horizontal stretch by a factor of 3, translation down 3 units, translation left 4 units



8. a) domain:  $\{x \mid x \leq 0, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \geq -4, y \in \mathbb{R}\}$  b) domain:  $\{x \mid x \geq 4, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \geq 0, y \in \mathbb{R}\}$  c) domain:  $\{x \mid x \geq 4, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \leq 4, y \in \mathbb{R}\}$  d) domain:  $\{x \mid x \geq 0, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \leq 0, y \in \mathbb{R}\}$

9. a)  $y = 2\sqrt{x-7} + 3$  b)  $y = 2\sqrt{-(x-3)}$  c)  $y = \sqrt{0.5(x+5)}$

10. a) reflection in the  $y$ -axis, translation left 7 units

b) horizontal stretch by a factor of  $\frac{1}{2}$ , translation

right 3 units, translation up 5 units

c) reflection in the  $y$ -axis, translation right 5 units, translation up 7 units

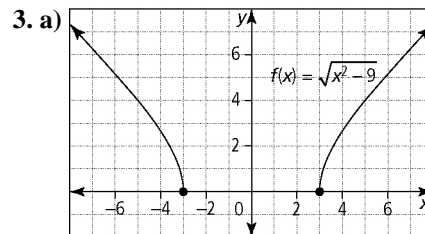
### BLM 2-4 Section 2.2 Extra Practice

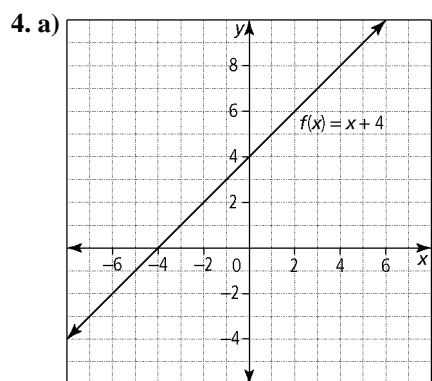
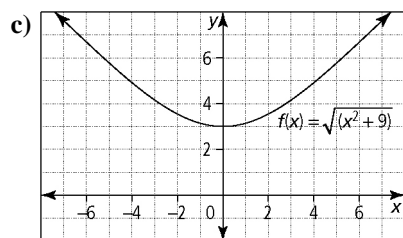
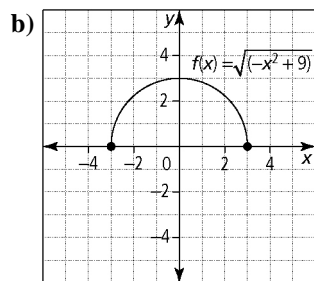
1.

$x$	$f(x)$	$\sqrt{f(x)}$
-2	16	4
-1	8	2.83
0	4	2
1	1.96	1.4
2	1	1

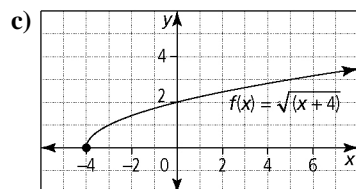
2. a) (9, 3.74) b)  $(p, \sqrt{r})$  c) (-2, 2.65)

d) No corresponding point exists.

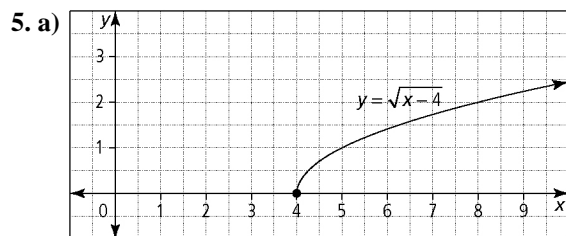




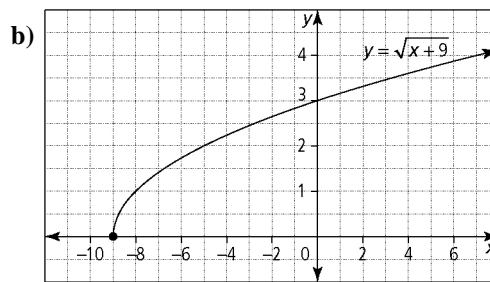
b) domain:  $\{x \mid x \in \mathbb{R}\}$ ; range:  $\{y \mid y \in \mathbb{R}\}$



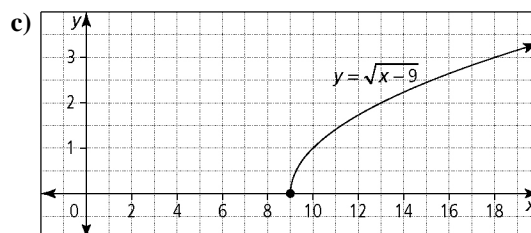
d) domain:  $\{x \mid x \geq -4, x \in \mathbb{R}\}$ ;  
range:  $\{y \mid y \geq 0, y \in \mathbb{R}\}$



domain:  $\{x \mid x \geq 4, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \geq 0, y \in \mathbb{R}\}$



domain:  $\{x \mid x \geq -9, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \geq 0, y \in \mathbb{R}\}$



domain:  $\{x \mid x \geq 9, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \geq 0, y \in \mathbb{R}\}$

6. a)  $y = x + 5$ : domain:  $\{x \mid x \in \mathbb{R}\}$ ,

range:  $\{y \mid y \in \mathbb{R}\}$ ;  $y = \sqrt{x+5}$ : domain:

$\{x \mid x \geq -5, x \in \mathbb{R}\}$ , range:  $\{y \mid y \geq 0, y \in \mathbb{R}\}$

b)  $y = 3x - 9$ : domain:  $\{x \mid x \in \mathbb{R}\}$ , range:

$\{y \mid y \in \mathbb{R}\}$ ;  $y = \sqrt{3x-9}$ : domain:  $\{x \mid x \geq 3, x \in \mathbb{R}\}$ ,  
range:  $\{y \mid y \geq 0, y \in \mathbb{R}\}$

c)  $y = -x - 10$ : domain:

$\{x \mid x \in \mathbb{R}\}$ , range:  $\{y \mid y \in \mathbb{R}\}$ ;  $y = \sqrt{-x-10}$ :

domain:  $\{x \mid x \leq -10, x \in \mathbb{R}\}$ ,

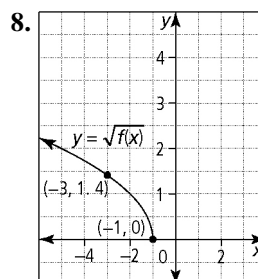
range:  $\{y \mid y \geq 0, y \in \mathbb{R}\}$

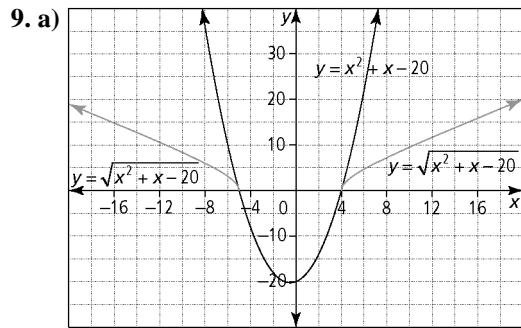
7. a) domain:  $\{x \mid x \leq -4 \text{ and } x \geq 4, x \in \mathbb{R}\}$ ;

range:  $\{y \mid y \geq 0, y \in \mathbb{R}\}$

b) domain:  $\{x \mid x \in \mathbb{R}\}$ ; range:  $\{y \mid y \geq \sqrt{5}, y \in \mathbb{R}\}$

c) domain:  $\{x \mid x \in \mathbb{R}\}$ ; range:  $\{y \mid y \geq \sqrt{18}, y \in \mathbb{R}\}$





b) Example: The graph of  $y = x^2 + x - 20$  has  $y$ -values that are less than zero for values of  $x$  between  $-5$  and  $4$ . Therefore,  $y = \sqrt{x^2 + x - 20}$  is undefined for this interval of  $x$ .

10. a) Example: all points that have a  $y$ -value of  $0$  or  $1$

b) Example: all points that have a negative  $y$ -value

### BLM 2-5 Section 2.3 Extra Practice

1. a)  $x = 3$  b)  $x = 0$  c) no solution d)  $x = -1$

2. Example: In each case, graph the single function and identify the  $x$ -intercepts or graph the set of functions and identify the  $x$ -value of the point of intersection.

a)  $y = \sqrt{5x^2 + 11} - x - 5$  or  $y = \sqrt{5x^2 + 11}$   
 $y = x + 5$

b)  $y = \sqrt{2x^2 - 7} - x - 3$  or  $y = \sqrt{2x^2 - 7}$   
 $y = x + 3$

c)  $y = \sqrt{13 - 4x^2} - 2 + x$  or  $y = \sqrt{13 - 4x^2}$   
 $y = 2 - x$

d)  $y = \sqrt{-2x^2 + 9} + x - 3$  or  $y = \sqrt{-2x^2 + 9}$   
 $y = 3 - x$

3. a)  $x = 4$  and  $x = -4$  b)  $x = -9$  c)  $x = 2$  and  $x = -7$

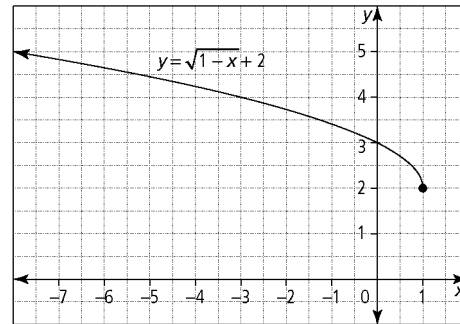
d)  $x = -3$

4. a)  $x = 4$  b) no solution c)  $x = 6$  d)  $x = 26$

5. a)  $x = 2$  b)  $x = 12$  c)  $x = 5$  d)  $x = 6$

6. a)  $x = 4.6$  b)  $x = 3.6$  c)  $x = -5.5$  d)  $x = 9.8$

7. a) graphical approach:



algebraic approach:

$$\begin{aligned} \sqrt{1-x} + 2 &= 0 \\ \sqrt{1-x} + 2 - 2 &= 0 - 2 \\ \sqrt{1-x} &= -2 \end{aligned}$$

This result is not possible because a square root cannot equal a negative value.

b) Example: Yes; isolate the radical. If it is equal to a negative value, then the equation has no solution.

8. 11 m

9. a) 3.7 cm b) 137 cm<sup>2</sup>

10.  $x = 3$