

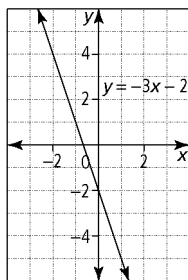
Chapter 7 BLM Answers

BLM 7-2 Chapter 7 Prerequisite Skills

1. a) 7.68 b) -3.08 c) 1.134 d) -5.2

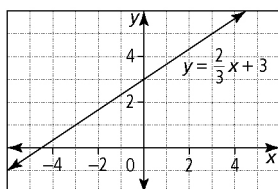
2. a)

x	y
-3	7
-2	4
-1	1
0	-2
1	-5
2	-8
3	-11



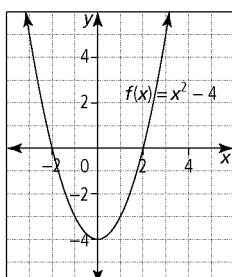
b)

x	y
-3	1
-2	1.67
-1	2.33
0	3
1	3.67
2	4.33
3	5



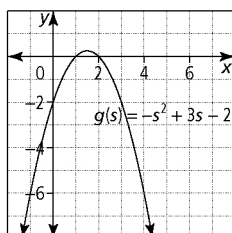
c)

x	f(x)
-3	5
-2	0
-1	-3
0	-4
1	-3
2	0
3	5



d)

g	s
-3	-20
-2	-12
-1	-6
0	-2
1	0
2	0
3	-2



3. a) i) domain: $\{x \mid x \in \mathbb{R}\}$; range: $\{y \mid y \in \mathbb{R}\}$

ii) $\left(-\frac{2}{3}, 0\right)$ iii) $(0, -2)$ iv) none

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

ii) $(-4.5, 0)$ iii) $(0, 3)$ iv) none

c) i) domain: $\{x \mid x \in \mathbb{R}\}$; range: $\{f(x) \mid f(x) \geq -4, f(x) \in \mathbb{R}\}$ ii) $(-2, 0)$ and $(2, 0)$ iii) $(0, -4)$

iv) minimum at $(0, -4)$

d) i) domain: $\{s \mid s \in \mathbb{R}\}$; range: $\{g(s) \mid g(s) \leq 0.25, g(s) \in \mathbb{R}\}$ ii) $(1, 0)$ and $(2, 0)$ iii) $(0, -2)$

iv) maximum at $(1.5, 0.25)$

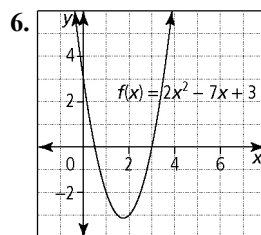
4. a) cannot be simplified, $x \neq -3$

b) $\frac{x-2}{x+2}$, $x \neq \pm 2$ c) $-4(x+y)$, $x \neq y$

d) $\frac{(x-2y)(x+2y)^2}{3}$, no non-permissible values

5. a) $y = 4x - 19$ b) $y = -3x + 7$

c) $y = 2x - 9$ d) $y = \frac{3}{4}x - 9$



a) $(1.75, -3.125)$ b) $x = \frac{7}{4}$ or $x = 1.75$

c) upward d) minimum value: -3.125

e) domain: $\{x \mid x \in \mathbb{R}\}$;

range: $\{f(x) \mid f(x) \geq -3.125, f(x) \in \mathbb{R}\}$

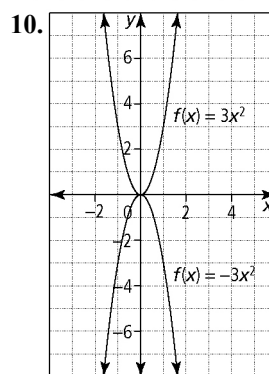
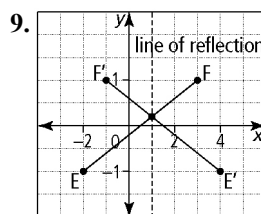
f) $(0.5, 0)$, $(3, 0)$; $(0, 3)$

7. a) $(4x-9)(x-1)$ b) $\frac{1}{2}(x-4)(x+1)$

c) $(5p-2)(p+3)$ d) $(3v+10)(v+2)$

8. a) $x = -\frac{5}{3}$ and $x = 1$ b) $x = \frac{2 \pm \sqrt{7}}{3}$

c) $x = -\frac{9}{5}$ d) $x = -\frac{1}{2}$ and $x = 3$



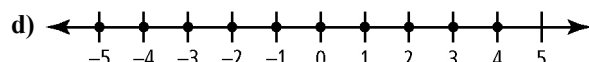
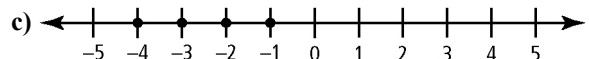
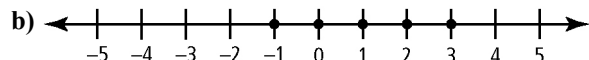
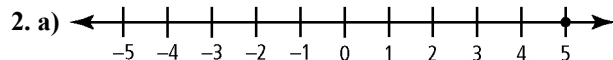
11. a) $x \leq 1$ b) $x \leq \frac{5}{2}$ c) $x \geq 6$ d) $x \leq -6$



BLM 7-3 Chapter 7 Warm-Up

Section 7.1

1. a) -7 b) 3 c) 9 d) 3 e) 5 f) -5



3. a) $-3 \leq x \leq 1, x \in \mathbb{I}$ b) $x > -1, x \in \mathbb{R}$

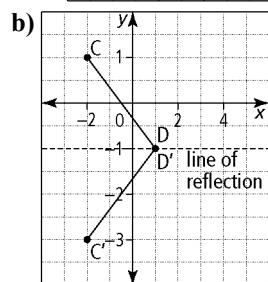
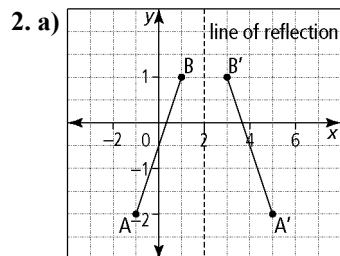
c) $-2 < x \leq 3, x \in \mathbb{R}$ d) $x = -1$

4. a) 0 b) 4 units c) B and E d) $\frac{1}{2}$

5. a) $+14^\circ\text{C}$ b) $+45^\circ\text{C}$ c) $+26^\circ\text{C}$ d) -27°C

Section 7.2

1. a) -6 b) -5 c) 5 d) 18 e) 9

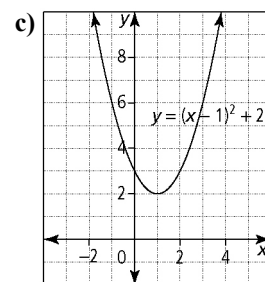
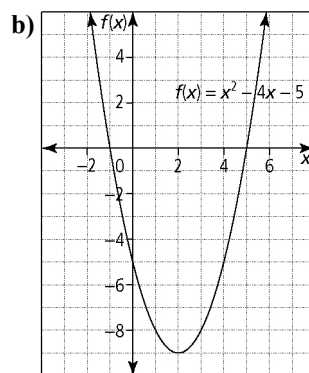
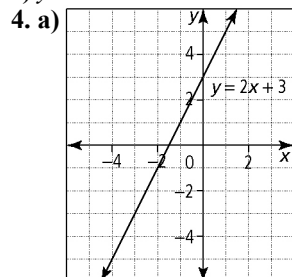


3. a) There is only 1 zero and it is between 0 and 1.

b) domain: $\{-2 \leq x \leq 1, x \in \mathbb{R}\}$;

range: $\{-1 \leq y \leq 1, y \in \mathbb{R}\}$

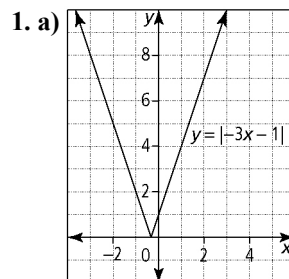
c) $y = -1$



5. a) $y = \frac{3}{2}x - \frac{1}{2}$

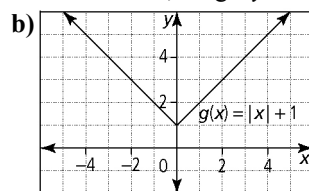
b) $y = -(x + 1)^2 + 3$ or $y = -x^2 - 2x + 2$

Section 7.3

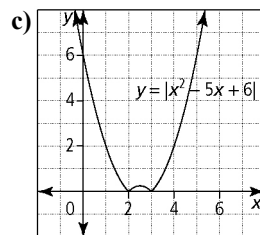


y-intercept: (0, 1); x-intercept: $\left(-\frac{1}{3}, 0\right)$;

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

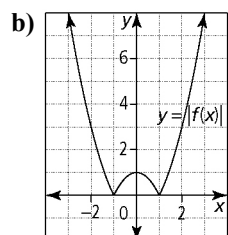
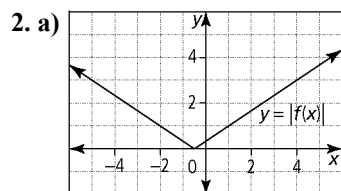


y-intercept: (0, 1); x-intercept: none; domain: $x \in \mathbb{R}$;
range: $y \geq 1$



y-intercept: (0, 6); x-intercepts: (2, 0) and (3, 0);
domain: $x \in \mathbb{R}$; range: $y \geq 0$





3. a) $x = \frac{5}{2}$ b) $x = 3$ c) $x = 3$

4. a) $x = \pm 1$ b) $x = -3, x = 2$ c) $x = -\frac{2}{3}, x = 1$

5. a) $y = \begin{cases} x-2, & \text{if } x \leq 0 \\ -x+2, & \text{if } x < 0 \end{cases}$ b) $y = \begin{cases} 2x+2, & \text{if } x \geq 0 \\ -2x-2, & \text{if } x < 0 \end{cases}$

Section 7.4

1. a) $-\frac{1}{3}$ b) 4 c) $\frac{1}{2x}$ d) $\frac{x-3}{5x}$

2. a) none b) $x \neq 2$ c) $x \neq \pm 1$ d) $x \neq -2$ and $x \neq -1$

3. a) $x = 3$ and $x = -\frac{5}{3}$; both solutions check

b) $x = 2$ and $x = -4$; both solutions check

c) $x = -5$ and $x = 1$; solution $x = -5$ is extraneous

d) $x = 1$ and $x = 0$; both solutions check

4. a) $y = (x+1)^2 + 2$ or $y = x^2 + 2x + 3$

b) $y = -x^2 + 2x + 8$ c) $y = x^2 - 4x + 4$

5. Let each denominator equal zero and solve the resulting equation. Each solution is a non-permissible value for the rational expression.

BLM 7-4 Section 7.1 Extra Practice

1. a) 42 b) $\frac{82}{3}$ c) 3.75 d) $1\frac{5}{6}$

2. a) $|-3|, |-3.9|, |-4|, |-4.1|, |-4.5|$

b) $-\left|\frac{6}{10}\right|, \left|\frac{6}{25}\right|, \left|-\frac{6}{20}\right|, \left|-\frac{6}{15}\right|, \left|-\frac{6}{5}\right|$

3. a) $|-2.1|, \left|-\frac{3}{4}\right|, |-0.6|, \left|-\frac{5}{3}\right|, |-1.2|$

b) $\left|\frac{46}{2}\right|, \left|-\frac{1}{23}\right|, \left|-\frac{2}{46}\right|, -2\left(\left|\frac{1}{23}\right|\right), -23$

4. a) 14 b) 32 c) 13 d) -2.4

5. a) 16 b) -6.75 c) $\frac{10}{3}$ d) 49

6. a) 8 b) 16 c) 9 d) 8

7. a) 1.5 b) 4 c) 2 d) 3

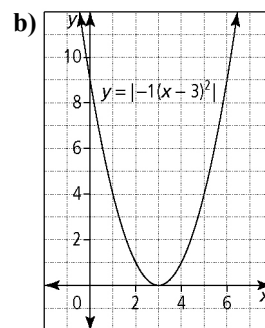
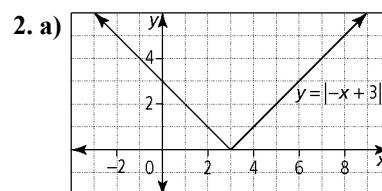
BLM 7-5 Section 7.2 Extra Practice

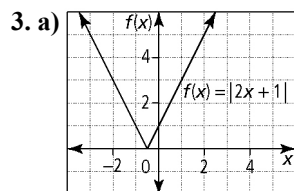
1. a)

x	y
0	1
2	0
4	1
6	2
8	3

b)

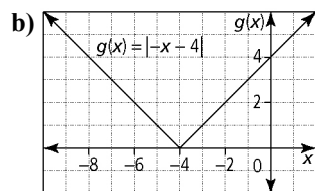
x	y
-4	8
-2	0
0	0
2	8
4	24





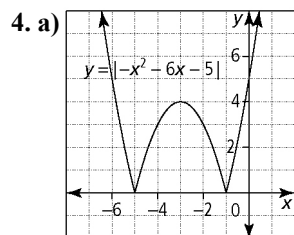
x-intercept: $\left(-\frac{1}{2}, 0\right)$; y-intercept: $(0, 1)$;

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



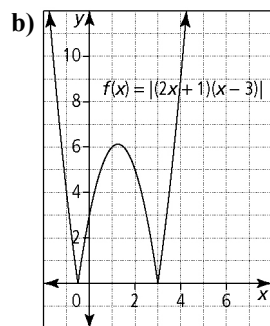
x-intercept: $(-4, 0)$; y-intercept: $(0, 4)$;

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



x-intercepts: $(-5, 0)$ and $(-1, 0)$; y-intercept: $(0, 5)$;

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



x-intercepts: $\left(-\frac{1}{2}, 0\right)$ and $(3, 0)$; y-intercept: $(0, 3)$;

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

5. a)
$$y = \begin{cases} 5x + 1, & \text{if } x \geq -\frac{1}{5} \\ -5x - 1, & \text{if } x < -\frac{1}{5} \end{cases}$$

b)
$$y = \begin{cases} -\frac{1}{2}x + 4, & \text{if } x \leq 8 \\ \frac{1}{2}x - 4, & \text{if } x > 8 \end{cases}$$

c)
$$y = \begin{cases} 2(x+2)^2 - 8, & \text{if } x \leq -4 \text{ or } x \geq 0 \\ -2(x+2)^2 + 8, & \text{if } -4 < x < 0 \end{cases}$$

d)
$$y = \begin{cases} -2(x+3)(x-1), & \text{if } -3 \leq x \leq 1 \\ 2(x+3)(x-1), & \text{if } x < -3 \text{ or } x > 1 \end{cases}$$

6. a) $h(x)$ and $k(x)$ **b)** all

c) $g(x)$, $h(x)$, and $k(x)$ **d)** all

7. a) all points where $x > 3$ **b)** $(0, 0)$

c) all points where $-4 < x < 0$ **d)** all points

BLM 7-6 Section 7.3 Extra Practice

1. a) $x = -3$ or $x = 1$ **b)** no solution

c) $x = \pm \frac{5}{2}$ **d)** $x = 0$

2. a) yes **b)** no **c)** yes **d)** yes

3. a) $x = \frac{1}{4}$ **b)** no solution **c)** $x > 5$ **d)** $n = 8$

4. a) $x = 1 \pm \sqrt{2}$ and $x = 1$

b) $x = 4$ and $x = -1$

c) $x = 2$ and $x = -8$

d) $x = 1 \pm \frac{\sqrt{7}}{2}$, $x = \frac{1}{2}$, and $x = \frac{3}{2}$

5. a) $x = -5$ or $x = 5$

b) $x = \frac{-3}{2}$, $x = -1$, $x = \frac{-1}{2}$, and $x = 3$

c) $x = 2$ and $x = 6.25$ **d)** $x = 1 \pm 2\sqrt{2}$ and $x = 1$

6. a) yes **b)** no **c)** yes **d)** no

7. a) not possible **b)** $k = 0$, $k > 4$

c) $k = 4$ **d)** $0 < k < 4$

8. Mark's solution is incorrect. $0 = (x + 4)(x - 3)$; $x = -4$ or $x = 3$

9. a) Rearrange the equation $|-x + 2| - \frac{x}{2} = 0$ to

$|-x + 2| = \frac{x}{2}$. The graph $f(x) = \frac{x}{2}$ is the right side

and $g(x) = |-x^2 + 2|$ is the left side. $f(x) = g(x)$ at the points of intersection. The intersection points are the solutions to the equation.

b) The solutions are 1.19 and 1.69.



BLM 7-7 Section 7.4 Extra Practice

1.

	Function	i) Reciprocal	ii) Domain	iii) Range
a)	$y = x + 4$		$\{x \mid x \in \mathbb{R}\}$	$\{y \mid y \in \mathbb{R}\}$
		$y = \frac{1}{x+4}$	$\{x \mid x \neq -4, x \in \mathbb{R}\}$	$\{y \mid y \neq 0, y \in \mathbb{R}\}$
b)	$y = 3x - 9$		$\{x \mid x \in \mathbb{R}\}$	$\{y \mid y \in \mathbb{R}\}$
		$y = \frac{1}{3x-9}$	$\{x \mid x \neq 3, x \in \mathbb{R}\}$	$\{y \mid y \neq 0, y \in \mathbb{R}\}$
c)	$y = (x+2)(x-2)$		$\{x \mid x \in \mathbb{R}\}$	$\{y \mid y \geq -4, y \in \mathbb{R}\}$
		$y = \frac{1}{(x+2)(x-2)}$	$\{x \mid x \neq \pm 2, x \in \mathbb{R}\}$	$\{y \mid y \neq 0, y \in \mathbb{R}\}$
d)	$y = x^2 + 6x + 9$		$\{x \mid x \in \mathbb{R}\}$	$\{y \mid y \geq 0, y \in \mathbb{R}\}$
		$y = \frac{1}{x^2 + 6x + 9}$	$\{x \mid x \neq -3, x \in \mathbb{R}\}$	$\{y \mid y \geq 0, y \in \mathbb{R}\}$

2.

	i) Zeros	ii) Reciprocal	iii) Non-permissible Values	iv) Vertical Asymptote
a)	$x = -3$	$y = \frac{1}{3+x}$	$x \neq -3$	$x = -3$
b)	$x = \frac{1}{2}$	$y = \frac{1}{2x-1}$	$x \neq \frac{1}{2}$	$x = \frac{1}{2}$
c)	$x = -2$ $x = 3$	$y = \frac{1}{(x+2)(x-3)}$	$x \neq -2$ $x \neq 3$	$x = -2$ $x = 3$
d)	$x = -1$ $x = -5$	$y = \frac{1}{-2x^2 - 12x - 10}$	$x \neq -1$ $x \neq -5$	$x = -1$ $x = -5$

3. a) $x = 5$ b) $x = \frac{2}{7}$

c) $x = -1, x = -0.5$ d) $x = -4, x = 3$

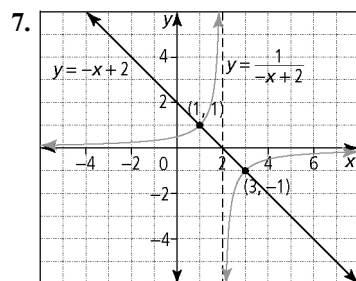
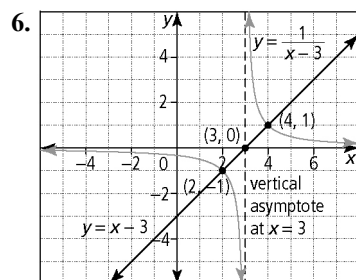
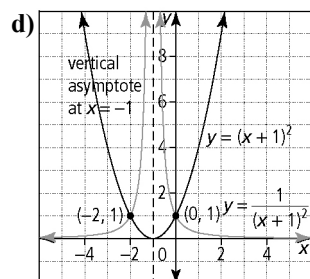
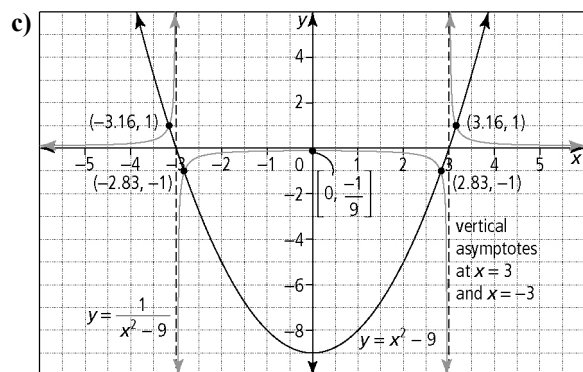
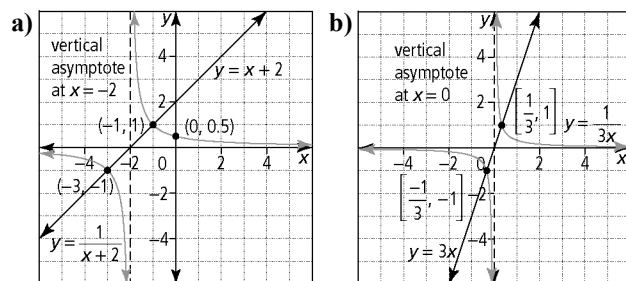
4. There are no x -intercepts, only y -intercepts.

a) $y = \frac{1}{5}$ b) $y = \frac{1}{3}$ c) $y = \frac{-1}{3}$ d) $y = \frac{1}{12}$

5.

	Reciprocal	Horizontal Asymptote	Vertical Asymptotes	Invariant Points	Intercepts
a)	$y = \frac{1}{x+2}$	$y = 0$	$x = -2$	$(-1, 1)$ and $(-3, -1)$	$y = \frac{1}{2}$
b)	$y = \frac{1}{3x}$	$y = 0$	$x = 0$	$\left(\frac{1}{3}, 1\right)$ and $\left(\frac{-1}{3}, -1\right)$	none
c)	$y = \frac{1}{x^2 - 9}$	$y = 0$	$x = -3$ $x = 3$	$(3.16, 1)$, $(-3.16, 1)$, $(2.83, -1)$, and $(-2.83, -1)$	$y = \frac{-1}{9}$
d)	$y = \frac{1}{(x+1)^2}$	$y = 0$	$x = -1$	$(-2, 1)$ and $(0, 1)$	$y = 1$





BLM 7-8 Chapter 7 Practice Test

1. C 2. A 3. B 4. C 5. B 6. C

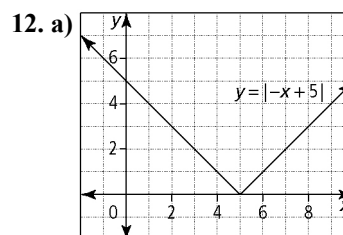
7. $|5|$

8.
$$y = \begin{cases} 3x - 4, & \text{if } x \geq \frac{4}{3} \\ -3x + 4, & \text{if } x < \frac{4}{3} \end{cases}$$

9. Example: $|x - 5| = 3$

10. $x = 3$

11. $x = -3$ and $x = 2$



b) (5, 0)

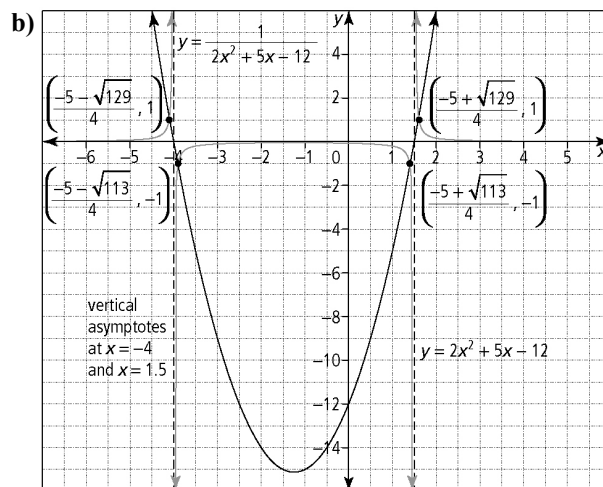
c) domain: $\{x \mid x \in \mathbb{R}\}$; range: $\{y \mid y \geq 0, y \in \mathbb{R}\}$

13. a) $|A - 16| = \frac{3}{4}$

b) 15 years and 3 months, or 16 years and 9 months

c) Alain could be older or younger than the average age.

14. a) $x = -4$ and $x = 1.5$



BLM U3-5 Unit 3 Test**1. D 2. B 3. A 4. C****5. 3****6. 300.7****7. 3****8. a)** $x \leq -\frac{5}{3}$ **b)** $x = -2$ or $x = -7$ **c)** The value $x = -7$ is extraneous.**d)** When substituting a value of -7 for x in the original equation, the equality does not hold true.**9. a)** $\frac{x+4}{3x+6} = \frac{2x+4}{6x+2}$ **b)** $x \neq 2$, $x \neq -\frac{1}{3}$; Since the side lengths must bepositive, $x \geq -\frac{1}{3}$.**c)** $x = 8$ **10. a)** Isolate the absolute value expression by adding $2x$ to both sides of the equation.**b)** $x = -1$ or $x = \frac{1}{3}$ **c)** Example: When evaluating an absolute value expression, the result is positive. However, a variable within an absolute value symbol can have a negative value.