

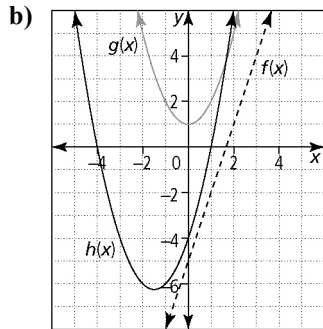
# Chapter 10 BLM Answers

## BLM 10-1 Prerequisite Skills

1. a) 28 b) -3 c) 3 d)  $\frac{3}{8}$   
 e)  $-x^3 - 3x^2 - x + 2$   
 2. a)  $2x - 4$  b)  $-4x^2 - x - 1$   
 c)  $4x^2 - 5x + 4$  d)  $4x^3 - 3x^2 - 8$   
 3. a)  $-x + 2$  b) 2  
 c)  $x^2 - 5x + 8$  d)  $-5x^2 + 5x - 1$   
 4. Two; depending on the order of subtraction  
 5. a)  $3x^3 - x^2 + x$  b)  $-12x^3$   
 c)  $3x^2 - 22x + 7$  d)  $4x^2 + 4x + 1$   
 e)  $x^3 - x^2 + x + 3$  f)  $x^3 - 6x^2 + 12x - 8$   
 6. a)  $x \neq -3; x - 2$  b)  $x \neq \frac{1}{3}; x + 1$   
 c)  $x \neq 1; 2x - 1$   
 7. a)  $y = 2x - 5$  b)  $y = -3x + 1$   
 c)  $y = -3x - 5$  d)  $y = -4x + 2$   
 8. a)  $y = x^2 + x - 6$   
 b)  $y = -x^2 + 2x - 1$   
 9. a) 0, 1, 2  
 b) domain:  $\{x | x \in \mathbb{R}\}$ ; range:  $\{y | y \in \mathbb{R}\}$   
 10. a)  $a = 1, b = -3, c = -4$   
 b)  $p(x) = (x + 2)(x + 1)(x - 4)$   
 11. a) translation of 3 units down  
 b) reflection in the  $x$ -axis  
 c) translation of 1 unit to the right  
 12. a)  $y = f(x) - 3$  b)  $y = -f(x)$   
 c)  $y = f(x - 1)$

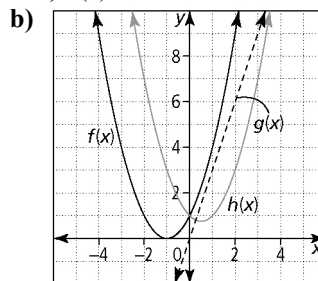
## BLM 10-2 Section 10.1 Extra Practice

1. a)  $h(x) = \sqrt{x-4} + 12$   
 b)  $h(x) = 7x - 4$   
 c)  $h(x) = 2x^2 - 4x + 3$   
 d)  $h(x) = x^2 + x + 17$   
 2. a)  $h(x) = x^2 + 3x - 4$

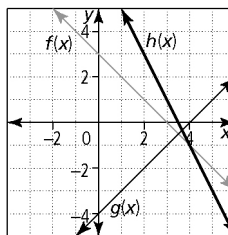


- c) domain:  $\{x | x \in \mathbb{R}\}$ ; range:  $\{y | y \geq -6.25, y \in \mathbb{R}\}$   
 3. a)  $h(x) = 10 - |x + 3|$  b)  $h(x) = x - 13$   
 c)  $h(x) = -x^2 + 4x + 8$  d)  $h(x) = -x^2 + 8x - 10$

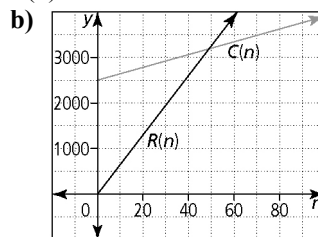
4. a)  $h(x) = x^2 - x + 1$



- c) domain:  $\{x | x \in \mathbb{R}\}$ ; range:  $\{y | y \geq 0.75, y \in \mathbb{R}\}$   
 5. a)  $y = x^2 + \sqrt{x-2} - 6$ ; domain:  $\{x | x \geq 2, x \in \mathbb{R}\}$ ;  
 range:  $\{y | y \geq -2, y \in \mathbb{R}\}$   
 b)  $y = \sqrt{x-2} - 2x + 1$ ; domain:  $\{x | x \geq 2, x \in \mathbb{R}\}$ ;  
 range:  $\{y | y \leq -2\frac{7}{8}, y \in \mathbb{R}\}$  Note: The actual range is difficult to determine from the graph, and the best estimate for range may be  $\{y | y \leq -3, y \in \mathbb{R}\}$ .  
 c)  $y = 2x - \sqrt{x-2} - 1$ ; domain:  $\{x | x \geq 2, x \in \mathbb{R}\}$ ;  
 range:  $\{y | 2\frac{7}{8} \leq y, y \in \mathbb{R}\}$  Note: The actual range is difficult to determine from the graph, and the best estimate for range may be  $\{y | 3 \leq y, y \in \mathbb{R}\}$   
 d)  $y = x^2 + 2x - 7$ ; domain:  $\{x | x \in \mathbb{R}\}$ ;  
 range:  $\{y | y \geq -8, y \in \mathbb{R}\}$   
 6. a)  $h(x) = x^2 + 4x - 2$ ; 10  
 b)  $m(x) = x^2 - 4x - 12$ ; -15  
 c)  $p(x) = x^2 + 4x - 2$ ; 3  
 7. a) 4 b) 6 c) 8 d) 8  
 8.



9. a)  $g(x) = x^2 + 2x + 2$  b)  $g(x) = \sqrt{x-7} - 3x + 5$   
 c)  $g(x) = 9$  d)  $g(x) = 2x^2 - 10x + 8$   
 10. a)  $C(n) = 2500 + 14n$   
 $R(n) = 65n$



- c) 50 people



**BLM 10-3 Section 10.2 Extra Practice**

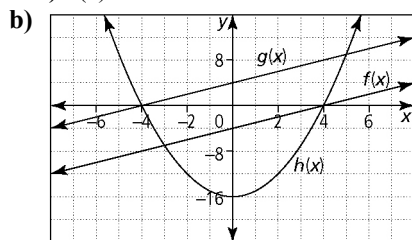
1. a)  $h(x) = 2x^2 + x - 15$

b)  $h(x) = 6x^2 - 7x - 3$

c)  $h(x) = x\sqrt{x-4} + 2\sqrt{x-4}$

d)  $h(x) = (\sqrt{x+1})(\sqrt{3-x})$

2. a)  $h(x) = x^2 - 16$



c) domain:  $\{x \mid x \in \mathbb{R}\}$ ; range:  $\{y \mid y \geq -16, y \in \mathbb{R}\}$

3. a)  $h(x) = \frac{x+3}{2x-5}$ ; domain:  $\left\{x \mid x \neq \frac{5}{2}, x \in \mathbb{R}\right\}$ ;

range:  $\{y \mid y \neq \frac{1}{2}, y \in \mathbb{R}\}$

b)  $h(x) = \frac{2x-3}{3x+1}$ ; domain:  $\left\{x \mid x \neq -\frac{1}{3}, x \in \mathbb{R}\right\}$ ;

range:  $\{y \mid y \neq \frac{2}{3}, y \in \mathbb{R}\}$

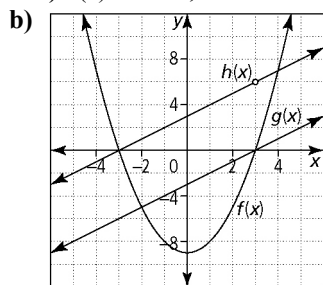
c)  $h(x) = \frac{\sqrt{x-4}}{x+2}$ ; domain:  $\{x \mid x \geq 4, x \in \mathbb{R}\}$ ;

range:  $\{y \mid 0 \leq y \leq \frac{\sqrt{6}}{12}, y \in \mathbb{R}\}$

d)  $h(x) = \frac{\sqrt{x+1}}{\sqrt{3-x}}$ ; domain:  $\{x \mid -1 \leq x < 3, x \in \mathbb{R}\}$ ;

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

4. a)  $h(x) = x + 3, x \neq 3$



c) domain:  $\{x \mid x \neq 3, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \neq 6, y \in \mathbb{R}\}$

5. a)  $y = 2x^2 + 3x + 1$ ; domain:  $\{x \mid x \in \mathbb{R}\}$ ;

range:  $\{y \mid y \geq -0.125, y \in \mathbb{R}\}$

b)  $y = 2x^3 + 9x^2 + 10x + 3$ ;

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

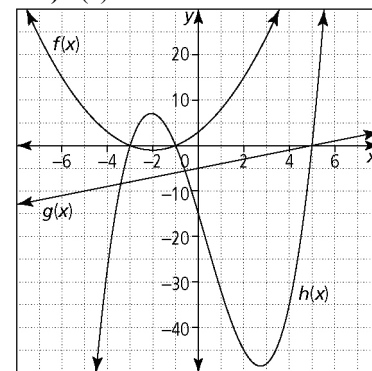
c)  $y = \frac{2x+1}{x+1}$ ; domain:  $\{x \mid x \neq -1, x \in \mathbb{R}\}$ ;

range:  $\{y \mid y \neq 2, y \in \mathbb{R}\}$

d)  $y = x + 3$ ; domain:  $\{x \mid x \neq -\frac{1}{2}, x \in \mathbb{R}\}$ ;

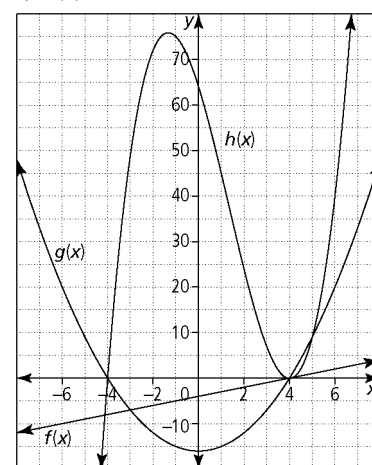
range:  $\{y \mid y \neq 2.5, y \in \mathbb{R}\}$

6. a)  $h(x) = x^3 - x^2 - 17x - 15$



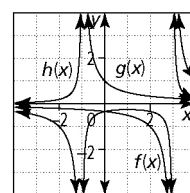
domain:  $\{x \mid x \in \mathbb{R}\}$ ; range:  $\{y \mid y \in \mathbb{R}\}$

b)  $h(x) = x^3 - 4x^2 - 16x + 64$



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

c)  $h(x) = \frac{1}{x^2 - 2x - 3}$



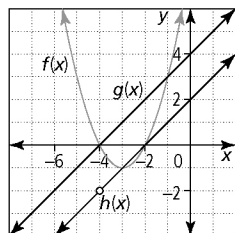
domain:  $\{x \mid x \neq -1, 3, x \in \mathbb{R}\}$ ; range:

$\{y \mid y > 0 \text{ or } y \leq -\frac{1}{4}, y \in \mathbb{R}\}$

7. a) 12 b) -3 c) -4 d) 0.8 e) 0.2 f) 5

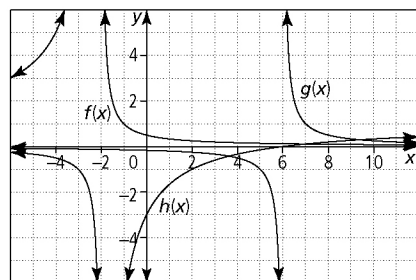


8. a)  $h(x) = x + 2$



domain:  $\{x \mid x \neq -4, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \neq -2, y \in \mathbb{R}\}$

b)  $h(x) = \frac{x-6}{x+2}$



domain:  $\{x \mid x \neq -2, 6, x \in \mathbb{R}\}$ ;

range:  $\{y \mid y \neq -2, 1, \text{ or } 6, y \in \mathbb{R}\}$

9. a)  $g(x) = x + 3$  b)  $g(x) = x + 2$

10. a)  $y = x^3 - 8x^2 + 11x + 20$

b)  $y = \frac{x^2 - 4x - 5}{x - 4}$  c)  $y = \frac{2x - 4}{x - 4}$

### BLM 10-4 Section 10.3 Extra Practice

1. a) 10 b) 40 c) 29 d) -1

2. a) -8 b) -8 c) 184 d) 14

3. a) 7 b) 0 c) -1 d) -2

4. a) 4 b) 6 c) 5 d) 3

5. a)  $y = 2a^2 + 3$

b)  $y = 4a^2 - 36a + 87$

c)  $y = 2x^2 + 3$

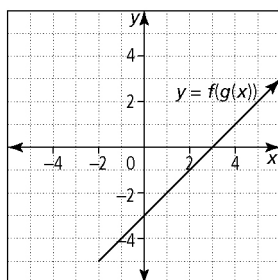
d)  $y = 4x^2 - 36x + 87$

e)  $y = 4x - 27$

f)  $y = x^4 + 12x^2 + 42$

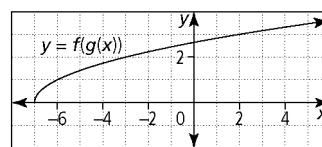
6. a)  $y = x - 3$

b)



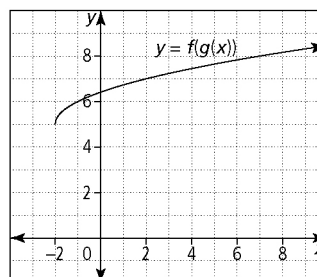
c) domain:  $\{x \mid x \geq -2, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \geq -5, y \in \mathbb{R}\}$

7. a)



domain:  $\{x \mid x \geq -7, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \geq 0, y \in \mathbb{R}\}$

b)



domain:  $\{x \mid x \geq -2, x \in \mathbb{R}\}$ ; range:  $\{y \mid y \geq 5, y \in \mathbb{R}\}$

8. a)  $f(g(x)) = 3x^2 + 5$ ;

$g(f(x)) = 9x^2 - 6x + 3$

b)  $f(g(x)) = 25x^2 + 70x + 45$ ;

$g(f(x)) = 5x^2 - 13$

c)  $f(g(x)) = x^4 + 2x^3 + x^2 - x$ ;

$g(f(x)) = x^4 - 2x^3 + x^2 + x$

d)  $f(g(x)) = x - 5$ ;

$g(f(x)) = \sqrt{x^2 - 5}$

9. a)  $g(x) = \sqrt{x - 4}$  b)  $g(x) = x + 3$

10. a)  $W(N(t)) = 3\sqrt{100 + 25t}$

b) domain:  $\{t \mid t \geq 0, t \in \mathbb{R}\}$ ;

range:  $\{W \mid W \geq 30, W \in \mathbb{R}\}$

c) 57 workers; 350 chairs

### BLM 10-6 Chapter 10 Test

1. D

2. B

3. C

4. C

5. C

6. i) D ii) A iii) B iv) C

7. a) 5 b) 1 c) 1 d) 3

8. a)  $h(x) = \frac{2x-1}{x^2-x}$ ;  $\{x \mid x \neq 0, 1; x \in \mathbb{R}\}$

b)  $h(x) = \frac{-1}{x^2-x}$ ;  $\{x \mid x \neq 0, 1; x \in \mathbb{R}\}$

c)  $h(x) = \frac{1}{x^2-x}$ ;  $\{x \mid x \neq 0, 1; x \in \mathbb{R}\}$

d)  $h(x) = \frac{x-1}{x}$ ;  $\{x \mid x \neq 0, 1; x \in \mathbb{R}\}$

9. a)  $q(x) = 2$  b)  $p(x) = x^2 + 2x + 2$

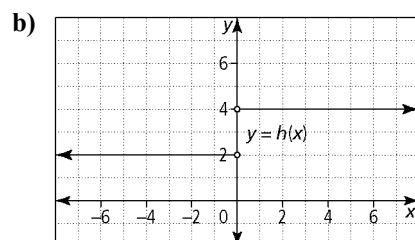
10.  $f(x) = x^2 - 5$ ;  $g(x) = 2x + 3$



**11. a)**  $h(x) = \frac{x^2}{2^x}; x \in \mathbb{R}$

**b)** as  $x$  increases,  $h(x)$  approaches 0

**12. a)**  $h(x) = \frac{3x + |x|}{x}$



**c)** domain:  $\{x \mid x \neq 0, x \in \mathbb{R}\}$ ;  
range:  $\{y \mid y \neq 2, 4; y \in \mathbb{R}\}$

**13. a)**  $g(x) = 3(x + 1)^2 - 5$  or  $g(x) = 3x^2 + 6x - 2$

**b)** vertically stretched by a factor of 3 about the  $x$ -axis, translated left 1 and translation down 5

**14. a)**  $h(g(x)) = \cos\left(\frac{1}{x}\right)$ ; domain:  $\{x \mid x \neq 0, x \in \mathbb{R}\}$

**b)**  $g(h(x)) = \sec x$ ;

domain:  $\left\{x \mid x \neq \frac{\pi}{2} + \pi n, n \in \mathbb{I}, x \in \mathbb{R}\right\}$

**15. a)**  $v(t) = \frac{60\pi}{t}$     **b)**  $v(t+1) = \frac{60\pi}{t+1}$

**c)** change in angular speed =  $\frac{60\pi}{t} - \frac{60\pi}{t+1}$ , or  $\frac{60\pi}{t^2 + t}$

