

Chapter 11 BLM Answers

BLM 11-1 Prerequisite Skills

1. a) -3 b) 504 c) 10 d) 22
 2. Example: 2, 3, 4, 5, 6, 7
 a) $2 \times 7 = 14$
 b) $3 \times 6 = 18$
 c) The product of the second and fifth numbers is always 4 greater than the product of the first and sixth numbers.
 3. a) $n + 1, n + 2, n + 3, n + 4, n + 5$
 b) $1\text{st} \times 6\text{th} = n(n + 5) = n^2 + 5n$; $2\text{nd} \times 5\text{th} = (n + 1)(n + 4) = n^2 + 5n + 4$
 c) Difference between products is $(n^2 + 5n + 4) - (n^2 + 5n) = 4$. This demonstrates that the difference between products is always 4.

4. a) $\frac{x-1}{x+2}, x \neq \pm 2$

b) $\frac{3(a-3)}{a+1}, a \neq -1, 4$

c) $\frac{n^2}{4(n+1)}, n \neq -5, -1, 0, 1$

5. a) 5 and 6, -5 and -6

b) 8 and 9, -8 and -9

c) 7 and 8

d) 5, 6, and 7

e) 3, 4, and 5

6. a) 25 b) 16 c) 55

7. a) Assume that digits are not repeated.

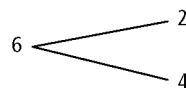
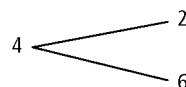
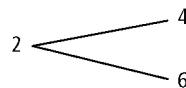
Start with		
2	4	6
24	42	62
26	46	64

- b) Assume that the order of selection is not important.

Q	Q	Q
Q	Q	N
Q	Q	D
Q	N	N
Q	N	D
Q	D	D
N	N	D
N	N	N
D	D	N
D	D	D

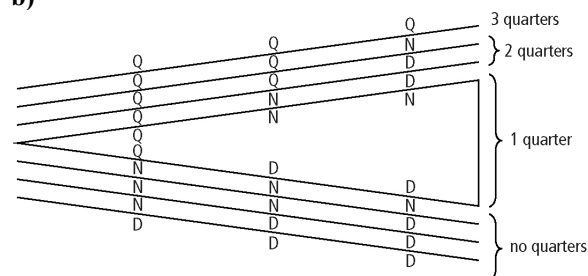
Q = quarter
 N = nickel
 D = dime

8. a)



First digit Second digit

b)



9. a) $x = 1$ b) $x = 15$

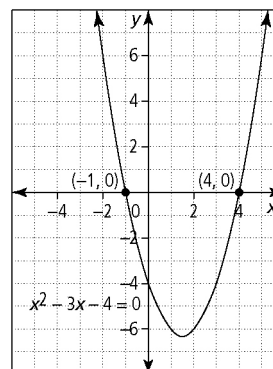
10. a) $7 + 2^4$ b) $41 + 2^4$ c) $17 + 2^6$ d) $3 + 2^1$

11. a) $x = -5$ or $x = 3$

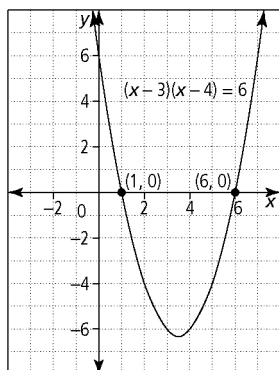
b) $x = \frac{1}{3}$ or $x = \frac{3}{2}$

c) $x = 3, x = -2$, or $x = -3$

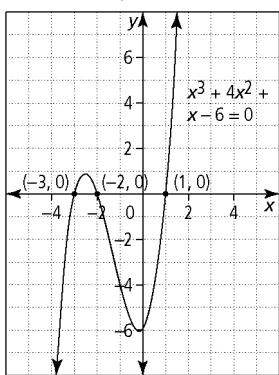
12. a) zeros at -1 and 4



b) zeros at 1 and 6



c) zeros at -3, -2 and 1



13. a) $a = 180 - 4x$; $b = 3x$

b) It is not possible to determine a unique value for x since every equation that you set up can be simplified to $0 = 0$, which is indeterminate. There are many values for x that satisfy the conditions. For example, x could be 40° , 30° , or 25° .

BLM 11-2 Section 11.1 Extra Practice

1. a) 6

strawberry-S, vanilla-V, chocolate-C

SVC

SCV

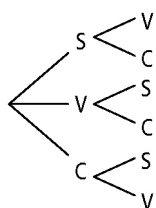
VSC

VCS

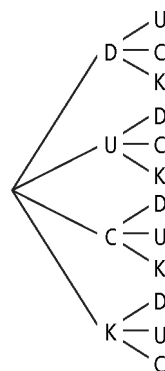
CSV

CVS

or



b) 12



or

DU

DC

DK

UD

UC

UK

CD

CU

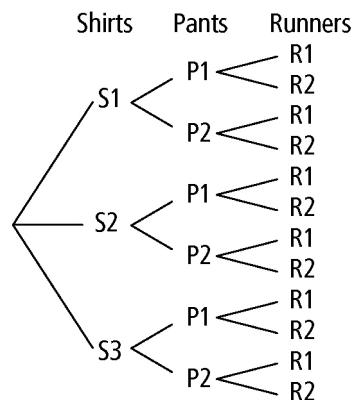
CK

KD

KU

KC

c) 12



2. $5! = 120$

3. a) $\frac{8!}{(8-r)!}$ b) $\frac{n!}{(n-5)!}$ c) $\frac{n!}{(n-r)!}$

4. a) 72 b) 336 c) 120

5. ${}_5P_2$ or $5 \times 4 = 20$

6. a) 20 160 b) 907 200 c) 105

7. a) 813 960 b) 120 120

8. a) 60 b) 30 c) 12 d) 3

9. ${}_{501}P_4$

10. a) $n = 8$ b) $n = 10$



BLM 11-3 Section 11.2 Extra Practice

1. **a)** combination; order does not matter
b) permutation; order matters
c) combination; order does not matter
d) permutation; order matters
2. Example:
a) How many 4-digit codes can be created using whole numbers if no repetition is allowed? A code such as 0245 is allowed; $(_{10}P_4)$
b) How many teams of 4 can be chosen from a group of 28 people?; $(_{28}C_4)$
3. **a)** 126 **b)** 990 **c)** 60 **d)** 302 400
4. **a)** $_{30}C_3 = 4060$ **b)** $_{30}P_3 = 24\ 360$
c) $_{10}C_1 \times _{20}C_2 = 1900$
5. 450
6. **a)** $n = 9$ **b)** $n = 6$ **c)** $n = 5$ **d)** $n = 6$
7. 148; Case 1—four women: $_5C_4 \times _8C_2 = 140$;
 Case 2—five women: $_5C_5 \times _8C_1 = 8$
8. $\frac{1}{2}(n^2 - n)$
9. **a)** 120 **b)** 48 **c)** 72

BLM 11-4 Section 11.3 Extra Practice

1. **a)** 1 2 1 **b)** 1 4 6 4 1 **c)** 1 6 15 20 15 6 1
2. **a)** $_4C_2$ **b)** $_7C_4$ **c)** $_{10}C_8$
3. **a)** 8 **b)** 10 **c)** $(n + 1)$
4. **a)** $a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$
b) $x^5 - 10x^4 + 40x^3 - 80x^2 + 80x - 32$
c) $64 + 48y + 12y^2 + y^3$
5. **a)** $27x^3 - 108x^2 + 144x - 64$
b) $16x^4 + 160x^3y + 600x^2y^2 + 1000xy^3 + 625y^4$
c) $a^5 - 10a^4b + 40a^3b^2 - 80a^2b^3 + 80ab^4 - 32b^5$
6. **a)** $35x^3y^4$ **b)** $34\ 992ab^7$ **c)** $-191\ 362\ 500x^5$
7. **a)** $(x - y)^5$ **b)** $(2 + x)^3$
8. $-\frac{135}{2}y^3$
9. 2160
10. 540

BLM 11-6 Chapter 11 Test

1. C
2. D
3. D
4. C
5. D
6. D
7. 1440
8. 1586
9. 99 min

10. $\frac{{}_{14}P_3}{{}_{13}C_2}, {}_7C_3, 3\left(\frac{6!}{2!4!}\right), {}_6P_4$

11. 12

12. 270

13. **a)** 6 **b)** 6 more

14. **a)** 89 640 936

b) Permutations are used because order is important for selecting the grade 12 students. Combinations are used because order is not important for selecting the students in grades 10 and 11.

15. 6

16. **a)** 3003 **b)** 1260 **c)** 2142

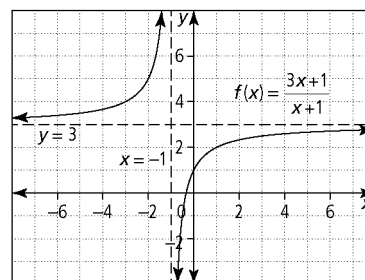
17. **a)** 1, 6, 15, 20, 15, 6, 1

b) ${}_6C_0, {}_6C_1, {}_6C_2, {}_6C_3, {}_6C_4, {}_6C_5, {}_6C_6$

c) $64x^6 - 576x^5y^2 + 2160x^4y^4 - 4320x^3y^6 + 4860x^2y^8 - 2916xy^{10} + 729y^{12}$

BLM U4-2 Unit 4 Test

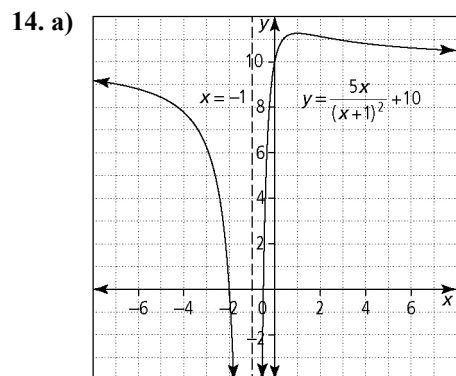
1. C
2. A
3. B
4. C
5. D
6. A
7. 1.95
8. 6
9. 1
10. 5688
11. 35
12. 3
13. **a)**



b) $y = \frac{-2}{x+1} + 3$

c) vertical stretch by a factor of 2 about the x -axis, reflection about the x -axis, horizontal translation 1 unit left, and a vertical translation 3 units up



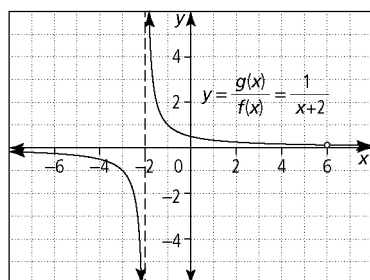
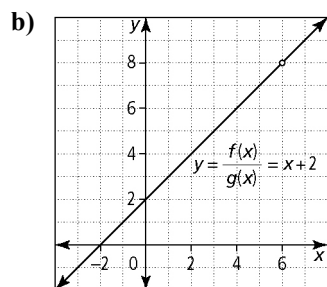


The x -intercepts are -0.5 and -2 .

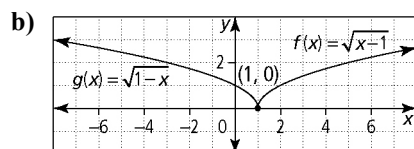
b) -0.5 and -2 **c)** The x -intercepts are the solutions to the equation.

15. a) $y = \frac{f(x)}{g(x)} = x + 2$, domain: $\{x \mid x \neq 6, x \in \mathbb{R}\}$;

$y = \frac{g(x)}{f(x)} = \frac{1}{x+2}$, domain: $\{x \mid x \neq -2, 6, x \in \mathbb{R}\}$

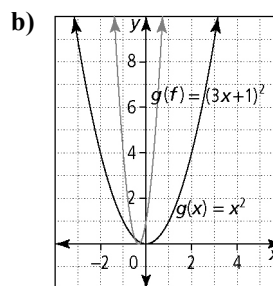


16. a) $h(x) = \sqrt{x-1} \times \sqrt{1-x}$



c) domain of f : $\{x \mid x \geq 1, x \in \mathbb{R}\}$; domain of g : $\{x \mid x \leq 1, x \in \mathbb{R}\}$; domain of h : $\{x \mid x = 1, x \in \mathbb{R}\}$

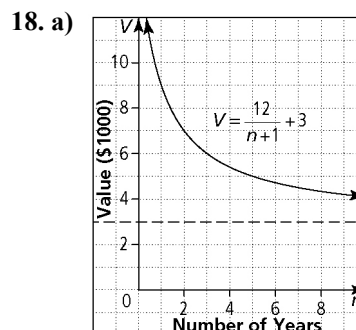
17. a) $g \circ f = (3x+1)^2$
 $= 9\left(x + \frac{1}{3}\right)^2$



c) Method 1: Horizontal stretch by a factor of $\frac{1}{3}$ about

the y -axis and a horizontal translation $\frac{1}{3}$ unit left

Method 2: vertical stretch by a factor of 9 about the x -axis and a horizontal translation $\frac{1}{3}$ unit left.



b) $V = 3$

c) As time goes by, the value of the car will reduce getting closer and closer to \$3000. The value will never go below \$3000.

19. a) $\frac{3}{2x}$ **b)** $-22\,680x^4y^6$ **c)** 53 760

20. a) 35 ways:

	1	1	1	1	
A	2	3	4		5
1	3	6	10		15
1					
1	4	10	20		35
				B	

b) $\frac{7!}{3! \times 4!} = 35$

