Name _____ Date _____

Master 10.17

Extra Practice 1

Section 10.1: Number Patterns

1. For each pattern:
   i) Describe the pattern.
   ii) Write the next 3 terms.
   a) 4, 7, 10, 13, 17, …

   b) 3, 6, 12, 24, …

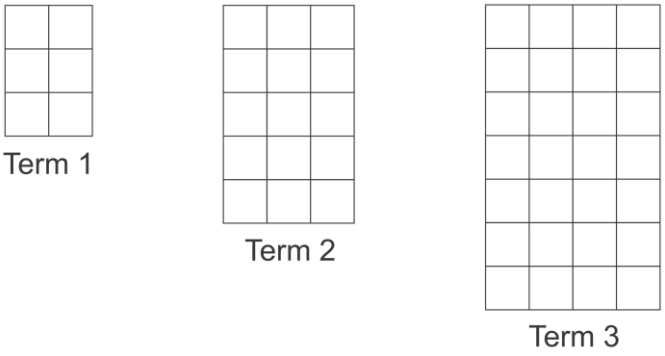
   c) 8, 15, 24, 35, …

   d) 5, 9, 13, 17, …

   e) 4, 9, 14, 19, …

   f) 105, 103, 101, 99, …

2. This pattern continues.



   a) Describe the pattern.
   b) Sketch the next 2 terms.
   c) How many squares are in the 10th term?
   d) How many squares are in the 15th term?

3. Create two different number patterns.
   Each pattern must contain the numbers 15 and 30.
   Describe each pattern in words.
   Write the next 4 terms in each pattern.

4. Create two different number patterns that contain the numbers 9, 12, and 18.
   Write the first 5 terms in each pattern.

Master 10.18

Extra Practice 2

Section 10.2: Graphing Patterns

1. Copy and complete this table for each pattern.

Input	Output
1	
2	
3	
4	
5	

a) Add 7 to each Input number.
b) Multiply each Input number by 4, then subtract 1.
c) Add 3 to each Input number, then multiply by 2.
d) Subtract two times each Input number from 13.

2. For each table:
i) Describe the pattern in the Output column.
ii) How can you find an Output number when you know an Input number?
iii) Write the next three rows in each table.

a)

Input	Output
3	15
4	18
5	21
6	24
7	27

b)

Input	Output
4	7
5	9
6	11
7	13
8	15

c)

Input	Output
10	6
20	11
30	16
40	21
50	26

3. The Grade 7 students sell boxes of granola bars to raise money for charity.
The students charge $3.25 per box.
a) A student sells 5, 10, 15, 20, and 25 boxes. Make a table for the money raised.
b) Graph the data in the table in *part a*.
c) Explain how the graph shows the pattern in the table.

4. Copy and complete the table for this pattern.
a) Divide each number by 3, then add 2.
b) Graph the pattern.
Explain how the graph shows the pattern.

Input	Output
3	
6	
9	
12	
15	

Master 10.19

Extra Practice 3

Section 10.3: Variables in Expressions

1. Write an algebraic expression for each statement.
   a) Eleven more than a number
   b) Nineteen times a number
   c) Twelve less than a number
   d) A number divided by seventeen

2. Which algebraic expression can be used to describe each phrase?
   Circle the correct answer.

a) A number decreased by 6	$n - 6$	$6 - n$	$\frac{n}{6}$
b) One-half a number	$a + \frac{1}{2}$	$\frac{1}{2} - a$	$\frac{a}{2}$
c) Double a number, then subtract 1.	$2x - 1$	$1 - 2x$	$x^2 - 1$
d) Five less than four times a number	$5 - 4n$	$4n - 5$	$4(n - 5)$
e) Twelve added to twice a number	$2n + 12$	$2(n + 12)$	$12 - 2n$

3. Write an algebraic expression for each statement. Use n as the variable.
   a) Twenty-five greater than a number
   b) One hundred divided by a number
   c) Eight times a number is subtracted from twenty-three
   d) Three less than the square of a number
   e) Thirteen subtracted from the product of three times a number
   f) A number increased by four, then multiplied by five

4. Write each algebraic expression in words.
   a) $5a$
   b) $9a + 3$
   c) $a - 2$
   d) $\frac{a}{3}$
   e) $6(a - 5)$

5. Find the area of a triangle with each base and height.
   a) base: 5 cm; height 6 cm
   b) base: 9 cm; height: 4 cm
   c) base: b centimetres; height: h centimetres

6. A person earns \$5/h shovelling snow. Find the money earned for each time.
   a) 4 h b) 9 h c) t hours

Master 10.20

Extra Practice 4

Section 10.4: Evaluating Algebraic Expressions

1. Complete each table.
   Explain how to get an Output number when you know an Input number.

a)

Input n	Output $7n + 1$
0	
2	
4	
6	
8	

b)

Input n	Output $2n^2$
3	
4	
5	
6	
7	

c)

Input n	Output $\frac{n}{5} + 4$
5	
10	
15	
20	
25	

2. Evaluate each expression by replacing k with 5.
   a) $k + 7$ b) $6k$ c) $10 - 2k$
   d) $\frac{50}{k} - 1$ e) k^2 f) $3(2k + 1)$

3. Write an algebraic expression for each statement.
   Evaluate each expression by replacing n with 9.

Statement	Expression	Value
a) The sum of a number and sixteen		
b) Ten more than twice a number		
c) Nine divided by a number, then add four		
d) The product of eleven and a number		
e) A number divided by three, then add one		

4. A value of n is substituted for each expression to get the number in the box.
   Find each value of n.
   a) $4n - 1$ | 23 |
   b) $\frac{n}{3} - 2$ | 2 |
   c) $2(n + 3)$ | 16 |
   d) $27 + 2n$ | 33 |
   e) $4(n - 2)$ | 28 |
   f) $26 - \frac{n}{2}$ | 21 |

Master 10.21

Extra Practice 5

Section 10.5: Reading and Writing Equations

1. Follow the steps to write each equation.
   Let n represent the number.
   a) Think of a number: _____

      Multiply the number by 4: _____

      Add six: _____

      The result is 62. What is the equation? _____

   b) Think of a number: _____

      Divide it by 5: _____

      Subtract 3: _____

      The result is 9. What is the equation? _____

2. Match each equation with the correct sentence.

a) $n + 3 = 6$	A. A number divided by three equals six.
b) $3n = 6$	B. The sum of a number and three is six.
c) $\frac{n}{3} = 6$	C. The product of a number and three is six.
d) $3n + 3 = 6$	D. Three more than three times a number is six.

3. Write each equation in words.
   a) $2x - 3 = 11$
   b) $4(x + 2) = 20$
   c) $\frac{x}{2} = 8$
   d) $2x + 14 = 62$

4. Write an equation for each sentence.
   a) Shawn's age 9 years from now will be 23.
   b) Six times the number of hot dogs sold is 552.
   c) The perimeter of a regular hexagon with side length s centimetres is 42 cm.
   d) The cost of three boxes of popcorn at \$3 each and two drinks at x dollars each is \$16.

Master 10.22

Extra Practice 6

Section 10.6: Solving Equations

1. Solve each equation.

   a) $4 + x = 15$

   b) $a + 7 = 21$

   c) $5 + 3d = 23$

   d) $6f + 2 = 26$

2. Solve each equation.

   a) $t - 3 = 8$

   b) $19 - 4n = 3$

   c) $5b - 3 = 17$

   d) $18 - 2w = 4$

3. Solve by inspection.

   a) $3n = 21$

   b) $\frac{33}{n} = 3$

   c) $17 - 3v = 2$

   d) $4c + 5 = 25$

4. Solve by systematic trial.

   a) $\frac{156}{n} = 26$

   b) $13d + 17 = 121$

   c) $17z = 153$

   d) $23h - 3 = 135$

5. The perimeter of a regular octagon is 88 cm.
   a) Write an equation you can solve to find the side length of the octagon.
   b) Solve the equation.

6. Write an equation you can solve to answer each problem.
   Solve each equation.
   a) Ruby has 27 pages of stamps in her collection.
      Zachary has 8 fewer pages than Ruby.
      How many pages of stamps does Zachary have?
   b) Nemo has 3 times as many DVDs as Ashley.
      Ashley has 16 DVDs.
      How many DVDs does Nemo have?
   c) Adrian walked 19 km less than Sheba.
      Sheba walked 35 km.
      How far did Adrian walk?