Date: _____

5.1 The Language of Mathematics

***MathLinks 9*, pages 174–182**

Key Ideas Review

Choose from the following terms to complete the statements in #1 to 3.

binomial	exponents	highest	monomial	polynomial
symbols	trinomial	variables		

1. Algebra uses _____, often letters, to represent unknown numbers or quantities. These unknown values are called _____.
2. A _____ is made up of terms. Some of these expressions have special names, depending on the number of terms they have.
   - A _____ has one term.
   - A _____ has two terms.
   - A _____ has three terms.
3. Each algebraic term has a degree, which you can find by adding the _____ of the variables in the term. A polynomial has the same degree as its _____-degree term.

Check Your Understanding

4. For each expression, identify the number of terms and state whether it is a monomial, binomial, trinomial, or polynomial.
   a) $2x - 5$
   b) 10
   c) $3z^2 - 6z + 7$
   d) $b^2 - ab - 4d + e^2$
5. For each expression, state the number of terms and the expression's degree.
   a) $ef + gh$
   b) $g^2 - 3g$
   c) 10
   d) $3s^2t - 2$

Date: _____

6. Refer to the following polynomials to answer the questions below.

$4c^2 - 3c + 2$	$4ab$
$2f - 4$	-12
$5p^2 - r$	$g + h + j$

Which of the above polynomials

a) are trinomials?

b) have a degree of 2?

c) have a degree of 0?

d) are monomials?

e) have a coefficient of 4?

7. Write the expression represented by each set of algebra tiles. Shaded tiles are positive and white tiles are negative.

a)

b)

c)

8. Sketch a model that represents the polynomial.

a) $x^2 + 3x - 2$

b) $-x^2 - 2x + 1$

9. Write an algebraic expression for each of the following:

a) the sum of 7 and x^2

b) the difference of $3x$ and 9

c) the product of x and 4

10. Use the given variables to write each statement as an algebraic expression.

a) If n is a number, the product of the number and 5

b) If w is the width of a rectangle and its length is 5 cm more than its width, the area of rectangle

c) If x is the number of kilometres, the cost of renting a car, in dollars, if the charge is \$40 plus \$0.80 per kilometre

Date: _____

5.2 Equivalent Expressions

***MathLinks 9*, pages 183–189**

Key Ideas Review

1. Complete the following statements.

   a) In the monomial $6ab$, the variables are _____ and _____.

   b) In the monomial $-7wx^2$, the coefficient is _____. The variables are w and x.

   The exponent for w is _____ and the exponent of x is _____.

   c) For the monomial 18, is there a coefficient or variable? YES NO

2. In the three *like* terms below, circle what is *alike* among them. Then, combine the terms.

   $3x^2$ $-4x^2$ $-x^2$ Combined term: _____

3. Are the terms below like terms? YES NO Explain.

   $5x$ $5x^2$ $5y$

Check Your Understanding

4. For each of the following, state the value of the coefficient. Then, state the number of variables for each term.

   a) y b) $-3b^2$

   c) $6st$ d) -15

   e) $-dh$ f) bc

5. Use the following monomial expressions to answer the questions below.

   $-cd$ $9r$ $4x$ k^2 $-xy$ $-3jk$

   a) Which have a coefficient of -1?

   b) Which have two variables?

   c) Which have a coefficient of 1?

   d) Which have only one variable, with an exponent of 1?

Date: _____

6. Circle the like terms in each group.

a) $14 \quad 3r \quad -r^2 \quad -r \quad 3s$

b) $-4y \quad 8xy \quad 2x \quad 0.3y \quad \frac{y}{2}$

c) $12c \quad cd \quad 1.2d \quad 6cd \quad cd^2$

7. Rearrange the polynomial by grouping like terms.

a) $9 - 5c - 8 + 5c^2 + c - c^3$

b) $8m - 9 + 2m^2 + 6 + 3m^2 - 6m$

c) $-5d^2 + 3d - 2 + 6d^2 - 8d + 7$

8. Rearrange each polynomial by grouping like terms. Then, simplify by adding or subtracting.

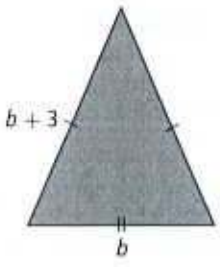
a) $-b^2 + 6 + 5b^2 - 8 + 9$

b) $7t + 14 + 6t - 5 - 3t^2 + 4t^2$

c) $5n - 3n^2 - 7 + 9n + 3 - 2n^2$

d) $3y^2 + 4 - 6y^2 - 6 + 3y - 5 + 2y$

9. Write and simplify an expression for the perimeter of the triangle by combining like terms.



10. a) Draw a figure with a perimeter that is represented by $(s) + (2s) + (s + 5) + (3s)$, where each value in parentheses represents the length of one side. Label each side length. Explain why you made each side the length that you did.

b) Simplify the expression for the perimeter by combining like terms.

11. A mechanic charges $70 an hour plus the cost of parts to repair a vehicle. The parts cost $215 for the repair on Tamara's car.

a) Write an expression for the total cost, C, of repairing Tamara's car for any number of hours, n.

b) Use the expression you created in part a) to calculate the cost of repairs that take $3\frac{1}{2}$ h.

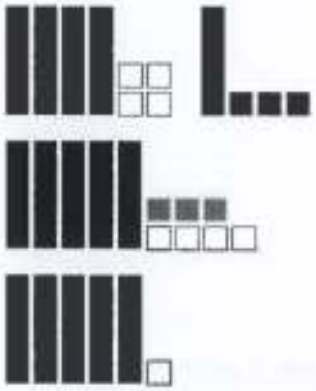
Date: _____

5.3 Adding and Subtracting Polynomials

MathLinks 9, pages 190–199

Key Ideas Review

1. Which equation does the algebra tile model represent? _____



A $(4x - 4) + (x + 3) = 5x - 1$

B $(4x + 4) - (-x + 3) = 5x + 1$

C $(2x - 2) + (3x + 1) = 5x - 1$

D $(2x - 2) - (-3x - 3) = 5x + 1$

2. One word can replace the question marks in the following sentences: The _?_ of a polynomial is found by taking the _?_ of each of the terms. To subtract polynomials, you can add the _?_.

   The word is _____.

Check Your Understanding

3. Add the polynomials.

   a) $(6y - 4) + (2y + 2)$

   b) $(b^2 + 5) + (-2b^2 - 3)$

   c) $(-3s^2 + 7s) + (-s^2 - 6)$

4. Perform the indicated operation. Then, simplify by combining like terms.

   a) $(8 + 5d) + (-d - 9)$

   b) $(-4m^2 - 4) + (-2m^2 - 1)$

   c) $(-6r^2 + 3r - 7) + (5r^2 - 2r - 2)$

5. Which of the statements do the algebra tiles represent? _____

A $(x^2 + x - 3) + (x^2 - 2x + 3)$

B $(x^2 + x - 3) + (-x^2 - 2x + 3)$

C $(x^2 - x - 3) + (-x^2 - 2x + 3)$

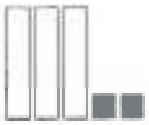
D $(x^2 + x + 3) + (-x^2 - 2x + 3)$

Date: _____

6. Give the opposite of the expression. Express your answer using both diagrams and symbols.

a) 

_____

b) 

_____

7. What is the opposite of each expression?

a) $-3y^2$

b) $6g - 3$

c) $2b^2 - 4b + 7$

d) $-4d^2 - 3d - 6$

e) $-k^2 - 8k + \frac{1}{2}$

8. Change the subtraction operation to adding the opposite. Then, combine like terms.

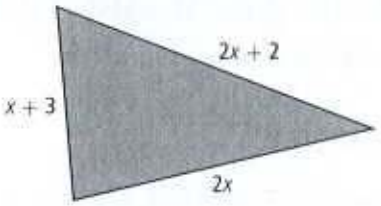
a) $(3r - 5) - (5r + 2)$

b) $(6 - 3f) - (4 - 5f)$

c) $(-4n^2 + 5) - (-n^2 - 9)$

d) $(6a^2 + 2a - 5) - (4a^2 + 5a + 7)$

9. Consider the triangle below.



a) Write the unsimplified expression for the perimeter.

b) Simplify the expression from part a) by combining like terms.

c) If the perimeter of the triangle is 25 cm, calculate the value of x. Verify that your answer is correct.

10. José, Tyler, and Mike split some money they made working on the weekend. They each worked a different number of hours, so they have to split the money fairly. José receives twice the amount that Tyler receives, and Mike receives $10 less than Tyler. Let x represent the amount that Tyler receives.

a) Write the expression that represents the total amount that they receive.

b) Simplify the expression in part a) by combining like terms.