The Language of Mathematics

November-22-16
7:25 PM

<div align="center">

Mathematics 9
Polynomials
The Language of Mathematics

</div>

A. Definitions

1. **algebra:** a branch of mathematics that uses symbols to represent unknown numbers or quantities. $(3x^2y)(2xy)$ $A = lw$

2. **variable:** a letter that represents an unknown number.
$$x, y, m, n, a, b, c. \longleftarrow \text{lower case.}$$

3. **coefficient:** a number that comes before a variable and that multiplies the variable.
$$\text{coefficient.} \to 3x$$

4. **constant:** a number by itself, or the known value in a algebra expression.
$$4$$

5. **term:** a number and variable combined or a constant value.
$$3x \quad , \quad 4$$

6. **expression:** algebra terms that are joined by addition or subtraction.
$$3x + 4 \quad , \quad x^2 + 4x - 5$$

7. **monomial:** an algebra expression with one term.
$$3x$$

8. **binomial:** an algebra expression with two terms.
$$3x + 4$$

9. **trinomial:** an algebra expression with three terms.
$$x^2 + 4x - 5$$

10. **polynomial:** an algebra expression made up of many terms.
$$x^5 + 3x^4 - 2x^3 + 4x^2 - 7$$

11. **degree of a polynomial:** calculate the sum of the exponents on each term of the polynomial. The degree of the polynomial will be one with the highest total.

$$\underset{3}{4x^2y} + \underset{2}{3xy} + \underset{4}{2x^2y^2} \qquad \boxed{4^{th} \text{ degree}}$$
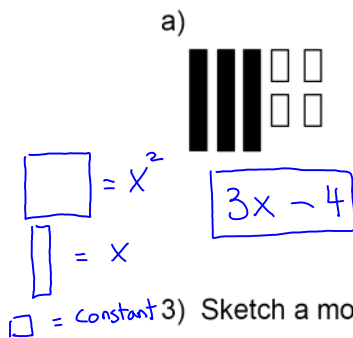
B. Polynomials and their Degrees

1) For each of the following identify the number of terms and whether the expression is a monomial, binomial, trinomial or polynomial. Then determine the degree of the polynomial.
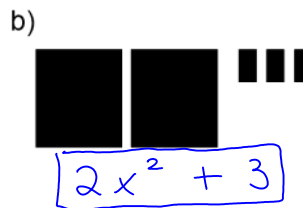
a) $\underset{2\ \ \ \ 0}{4xy + 3}$

2 terms
binomial
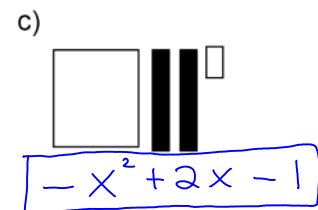2nd degree

b) $\underset{3\ \ \ \ \ 2\ \ \ \ \ \ 2\ \ \ \ 0}{5x^2y - 6x^2 + 2xy - 7}$
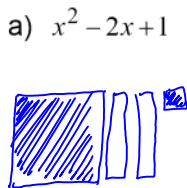
4 terms
Polynomial
3rd degree

c) 8

1 term
monomial.
0 degree

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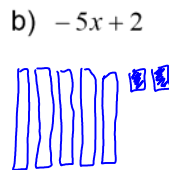
a)

$\square = x^2$
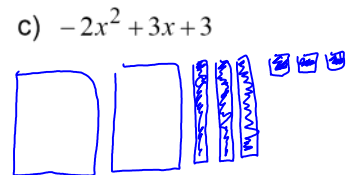$\|= x$
$\square = $ constant

3x − 4

b)

$2x^2 + 3$

c)

$-x^2 + 2x - 1$

3) Sketch a model that represents the following polynomials.

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

b) $-5x + 2$

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

4) Write an algebraic expression to represent the following:

a) difference of $5x^2$ and 3

$5x^2 - 3$

b) product of 8 and t

$8t$

c) sum of $3m$ and 7

$3m + 7$

Assignment: 5.1 The Language of Mathematics Assignment

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) $3s^2t - 2$

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
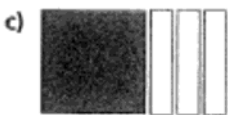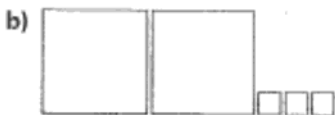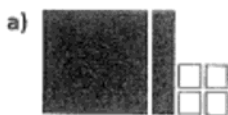
a) are trinomials?

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.

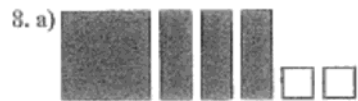a) If n is a number, the product of the number and 5

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

5.1 The Language of Mathematics

1. symbols, variables
2. polynomial, monomial, binomial, trinomial
3. exponents, highest
4. a) 2; binomial b) 1; monomial c) 3; trinomial
   d) 4; polynomial
5. a) 2; 2 b) 2; 2 c) 1; 0 d) 2; 3
6. a) $4c^2 - 3c + 2, g + h + j$
   b) $4c^2 - 3c + 2, 5p^2 - r, 4ab$ c) -12
   d) $4ab, -12$ e) $4c^2 - 3c + 2, 4ab$

7. a) $x^2 + x - 4$ b) $-2x^2 - 3$ c) $x^2 - 3x$
8. a)

   b)

9. a) $x^2 + 7$ b) $3x - 9$ c) $4x$
10. a) $5n$ b) $w(w + 5)$ or $w^2 + 5w$ c) $0.8x + 40$