Secondary Math 2

Unit 1: Algebra Basics

Unit 1.1: Classifying Polynomials

Polynomial Terminology	Definition	Examples
Coefficient		
Constant		
Term		
Degree		
Polynomial		

Polynomials can be classified by the number of **TERMS** in the polynomial and by the **DEGREE** of the polynomial.

Classify by the # of **TERMS:**

One Term	Two Terms	Three Terms	Any # of Terms

Classify by the **DEGREE** of the polynomial:

Linear	Quadratic	Cubic

Example 1: Classify each polynomial by # of terms and the Degree. List all coefficients and all constants.

a) $-10b - 1$

# of Terms:

Degree:

Coefficients:

Constants:

b) $-2a^2 - 3a + 7$

# of Terms:

Degree:

Coefficients:

Constants:

c) $-r^3$

# of Terms:

Degree:

Coefficients:

Constants:

d) $-6x^6 + 8x^4 + 2x^2 + x$

# of Terms:

Degree:

Coefficients:

Constants:

Example 2: Write a polynomial expression that contains the following:

a) A third degree trinomial with a constant

b) A quadratic binomial with a coefficient that is negative

c) A fourth degree polynomial with four terms that has coefficients that are not one and has a constant.

Unit 1.2: Distributive Property, Add/Subtract/Multiplying Polynomials

Let's take a minute to review a few skills that you have learned in previous courses.

DISTRIBUTIVE PROPERTY

Remember to **MULTIPLY** the number outside the parenthesis to every term inside the parenthesis. (Including the **NEGATIVE** if there is one!!)

Example 2: Simplify each expression

a) $9(1-8x)$

b) $-9(9n+8)$

c) $4-6(9a-4)$

d) $7(8+8k)+1$

e) $5(3-7x)-(1-6x)$

ADDING AND SUBTRACTING POLYNOMIALS

*Look at the operation ($+$ or $-$) in between the polynomials.
*Do that operation to combine terms from each polynomial.
Be VERY CAREFUL when subtracting.
*Make sure your solution is in the proper order:
Largest exponent first … this is called **STANDARD FORM.**

Example 4: Add or Subtract.

a) $(2n-7)+(2n+3)$

b) $(k^3-3)+(5+6k^3)$

c) $(8p-7)-(p-5)$

d) $(5-3m^2)-(6-8m^2)$

e) $(9r^2-7r)-(2r-r^2)$

f) $(2n-7)+(n+4+3n^3)$

g) $(4-3x)-(2-x^2-2x)$

MULTIPLYING POLYNOMIALS Multiplying polynomials is like using the distributive property … **twice!** Combine like terms to finish.	Remember …. * $a + a =$ * $a^2 \cdot a =$ * $a \cdot a =$ * $2a^3 \cdot 3a^2 =$

Example 5: Find each product.

a) $(3x + 6)(2x + 6)$

b) $(2v - 4)(5v - 4)$

c) $(3n - 4)(8n - 1)$

d) $(5b^2 + 2)(7b - 6)$

e) $(3x + 1)^2$

f) $-(y - 3)(2y + 5)$

Unit 1.3: Properties of Exponents

» An _____ is a quantity that shows the number of times a given number is being _____ by _____.

» An exponential term contains a _____ and a _____. (also known as the exponent)

Example:

$2 \cdot 2 \cdot 2 =$_____$=$

Example: a^n

____ is the base and

____ is the power.

PROPERTIES OF EXPONENTS

Property	Definition	Examples
Product of Powers		» $x^3 \cdot x^2$ » $2^4 \cdot 2^8$ » $v^3 \cdot y^7 \cdot v^5$
Quotient of Powers		» $\frac{x^5}{x^2} =$ » $\frac{5^{14}}{5^9} =$
Zero		» $y^0 =$ » $(2w)^0 =$ » $5r^0 =$
Negative Exponent		» $t^{-7} =$ » $\frac{1}{(5r^{-1})} =$
Power of a Power		» $(x^2)^3 =$ » $(2x^4)^2 =$ » $(2x \cdot 3y)^4$

Example 1: Simplify each expression. Your answer should contain only positive exponents.

a) $2n \cdot 2n$

b) $(r^2)^3$

c) $(5x)^2$

d) $2n \cdot n^4$

e) $3x^3 \cdot 2x^2$

f) $3k^{-3}k^2$

g) $3n^{-3} \cdot 2n$

h) $(2b^4)^3$

i) $(5t)^0$

j) $(2p^{-2})^{-3}$

k) $(3r^{-1})^3$

l) $\frac{x^5}{x^2}$

m) $\frac{(x^{-2})^{-2}}{3x}$

n) $2n^3 4m^4 n^4$

o) $4xy^2 \cdot 2x^3y^{-3}$

p) $\frac{2^{-1}}{(2^4)^2 \cdot 2^2}$

q) $\frac{2n^{-2} \cdot (2^{-1})^{-3}}{2n}$

r) $\frac{2x^3 \cdot x^2}{(2x^2)^{-1}}$

Everything we have practiced up until this point has had integer exponents. Sometimes, however, our exponents are rational meaning the exponents are _____.

Before we work with rational exponents – let's take a minute and review operations with fractions.

Add/Subtract	» $\frac{2}{3} + \frac{5}{9}$	» $\frac{1}{4} - \frac{3}{5}$
Multiply	» $\frac{2}{3} \cdot \frac{2}{5}$	» $\frac{1}{3} \cdot \frac{6}{7}$
Divide	» $\frac{2}{3} \div \frac{1}{2}$	» $\frac{7}{4} \div 14$

Example 2: Simplify each expression. Your answer should contain only positive exponents.

a) $3n^2 \cdot 4n^{\frac{1}{2}}$

b) $(r^2)^{\frac{1}{2}}$

c) $x^{\frac{1}{3}}x^{\frac{1}{3}}$

d) $n \cdot n^{\frac{4}{3}}$

e) $\left(v^{\frac{2}{3}}\right)^{\frac{1}{2}}$

f) $3k^{\frac{-1}{2}}k^2$

g) $\frac{2x^{\frac{3}{2}}}{2x}$

h) $\frac{b^{\frac{1}{2}}}{4b^{\frac{3}{2}}}$

i) $\frac{4v^{\frac{3}{2}} \cdot 6y^{-\frac{1}{4}}}{2v^{-1} \cdot y^{\frac{1}{2}}}$

$a^{\frac{m}{n}} = \sqrt[n]{a^m}$	What do the numbers mean when we are writing an expression with a rational exponent? The numerator of the _____ inside the _____. The denominator is the _____.

Example 3: Write each expression in exponential form:

a) $\left(\sqrt[5]{x}\right)^8$

b) $\sqrt[3]{(6x)^2}$

c) $\left(\sqrt{x}\right)^6$

Example 4: Write each expression in radical form:

a) $v^{\frac{1}{2}}$

b) $(3n)^{\frac{7}{4}}$

c) $2x^{\frac{4}{3}}$