

Warm-Up:

Simplify.

$$\frac{1}{3} \cdot \frac{1}{4} - \frac{2}{3} \cdot \frac{4}{4} = \frac{3}{12} - \frac{8}{12} = \frac{-5}{12}$$

Evaluate.

$$2) 5^3 = 5 \cdot 5 \cdot 5 = 25 \cdot 5 = 125$$

3) In a family tree, you are generation "now". One generation ago, your two parents were born. Two generations ago, your four grandparents were born. How many ancestors were born five generations ago?

$$0 \rightarrow 1$$

$$1 \rightarrow 2$$

$$2 \rightarrow 4$$

$$3 \rightarrow 8$$

$$4 \rightarrow 16$$

$$5 \rightarrow 32$$

$$2^0 = 1$$

$$2^1 = 2$$

$$2^2 = 4$$

$$2^5 = 32$$

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Section 1-1: Expressions and Formulas

In Algebra, letters are used in place of numbers that are unknown. These letters are called **variables**.

Whenever a number and variable are together with an arithmetic operation, it is an **algebraic expression**.

An algebraic expression can be evaluated by replacing each variable with a number and then applying the **order of operations**.

P	l	e	a	s	e	P	a	r	e	n	t	h	e	s	i	s
E	x	c	u	s	e	E	x	p	o	n	e	n	t	s		
M	y	M	u	l	t	i	p	l	i	c	a	t	i	o	n	
D	e	a	r	D	i	v	i	s	i	o	n					
A	u	n	t	A	a	d	d	i	t	i	o	n				
S	a	l	l	y	S	u	b	t	r	a	c	t	i	o	n	

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Examples:

Evaluate.

1) $(x - y)^3 + 3$ if $x = 1, y = 4$

$$(1-4)^3 + 3 \quad -27 + 3$$

$$(-3)^3 + 3 \quad -24$$

2) $s - t(s^2 - t)$ if $s = 2, t = 3$

$$2 - 3(2^2 - 3) \quad 2 - 3 \quad -1$$

$$2 - 3(1)$$

3) $\frac{8xy + z^3}{y^2 + 5}$ if $x = 5, y = -2, z = -1$

$$\frac{(8(5)(-2) + (-1)^3)}{(-2)^2 + 5} = \frac{(8 \cdot 5 \cdot (-2) + -1)}{(4 + 5)}$$

$$= \frac{-80 + -1}{9}$$

$$\frac{-81}{9} = -9$$

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A **monomial** is an expression that is either a numeral, a variable, or a product of both with whole number exponents.

The following are examples of monomials:

$$4x^6 \quad -14mn \quad y \quad .5a^4 \quad -10 \quad 2x^2y$$

The following are NOT monomials:

$$\frac{1}{y} \quad x^5 \quad x^2 + 4 \quad \underline{y^2 + 2y - 4}$$

Monomials:

- 1) Cannot divide by variables.
- 2) Have whole exponents.
- 3) Only multiply.

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A **polynomial** is a monomial or a sum of monomials.

The following are examples of polynomials:

$$7y + 9 \quad 3x^2 + 10x + 4 \quad -5a^3b^5 + 7ab - .5$$

In each polynomial, we can pick out one or more monomials. Each monomial is called a **term**.

When a polynomial has two terms it is called a **binomial**.

When a polynomial has three terms, it is called a **trinomial**.

When monomials can be combined, they are called **like terms**.

same variables
same exponents

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A monomial with no variables is called a **constant**.

Ex: 1 or -57

Each term in a polynomial has a coefficient. The **coefficient** is the number at the beginning of the term.

$$x^2 + 4a^2x^2z - 9xyz$$

The coefficients are: 1, 4, -9

The **degree of a term** is the sum of the exponents of the variables in that term.

The degrees of each term are: 2, 5, 3

Any expression with an exponent can be referred to as a **power**.

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A **formula** is a mathematical equation that shows how certain quantities can relate.

Example: The formula for volume of a rectangular prism is:

$V = l \cdot w \cdot h$ where V = volume, l = length of the prism, w = width, and h = height.

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Examples:

4) The formula for a trapezoid is $A = (1/2)h(b_1 + b_2)$ where h represents height and b_1 and b_2 represent the bases.

Find the area of a trapezoid with base lengths of 13 meters and 25 meters and a height of 8 meters.

$$A = \frac{1}{2}(8)(13+25)$$

$$A = 4(38)$$

$$A = 152 \text{ m}^2$$

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Homework: pg. 9-10 #9-14 all, 21-24 all, 31, 32, 35, 36, 40

Show your substitutions!!!

Answers-only will be counted incorrect.

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