Notes: Mathematical Expressions

Created for you by Ms. Nhotsoubanh

Definitions:

A ***mathematical expression*** is a *part of* a mathematical sentence that does not contain an equal sign.

Types:

a.) *Numerical Expression* – name for a number.

Examples of numeric expressions:	$3 + 4$	$\frac{8.2}{2}$	$(0.3)(0.2)$
Simpler Name:	7	4.1	0.06

Simplify: to make less complicated by reducing

b.) *Variable or Algebraic Expression* – mathematical expression which contains at least one variable.

Variable: a letter that is used to represent an unknown number

Examples of algebraic expressions: **5n,** **7 – x,** **3b + 4**

Parts of an expression:

a.) Terms: a single # or variable, or #s and variables multiplied together.

Example: The algebraic expression, $3a + 2x - 7$ has 3 terms.

b.) **Numerical Coefficient:** a number that is multiplied to a variable

Example: $3xy - 27b$; 3 is the coefficient of the xy term.
-27 is the coefficient of the b term.

c.) **Constant:** cannot change bc it does not contain any variable

Example 1: $5y - 6k + 4$ 4 is the constant

Example 2: $2f - 8n - 6$ -6 is the constant
-8 is the coefficient of the n term

Name: Key

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Evaluating an expression:

Evaluate means to find the numerical answer.

Steps to evaluate an expression:

1.) Substitute: Replace the variable with the given value.

2.) Simplify: Evaluate and find the answer performing the indicated operations. (Use Order of Operations)

Order of Operations

Follow "PEMDAS", remember with + & -, do what comes 1st !, and with x & ÷, do what comes 1st!

Example: $(5 + 3)^2 \div 4 \times 3 - 1$

$8^2 \div 4 \times 3 - 1$

$64 \div 4 \times 3 - 1$

$16 \times 3 - 1$

$48 - 1$

47

- Parentheses
- Exponents
- Multiplication/Division whichever comes FIRST
- Addition/Subtraction Whichever comes FIRST

Practice problems:

Directions: For #'s 1 & 2 evaluate the numerical expressions.

1.) $14 \div 2 \cdot 3 + 9 - 2^2$ $7 \cdot 3 + 9 - 4$ $21 + 9 - 4$ $30 - 4$ 26	2.) $[(7 - 4 + 8 \cdot 9) - 6 \cdot 2] - 3$ $[(7 - 4 + 72) - 12] - 3$ $[(3 + 72) - 12] - 3$ $[75 - 12] - 3$ $63 - 3$ 60 $75 - 12 = 63$

Directions: For #'s 3 & 4 evaluate the algebraic expressions when x = 5, and y = 2.

3.) $\dfrac{(4x - 3y) + 4}{x - y}$ $\dfrac{(4 \cdot 5 - 3 \cdot 2) + 4}{5 - 2}$ $\dfrac{(20 - 6) + 4}{3}$ $\dfrac{14 + 4}{3}$ $\dfrac{18}{3} \rightarrow 6$	4.) $6x^2 - [x + 4(x + y)]$ $6(5)^2 - [5 + 4(5 + 2)]$ $6 \cdot 25 - [5 + 4(7)]$ $150 - [5 + 28]$ $150 - 33$ 117 $150 - 33 = 117$

Homework....in your notebook show your work on page 8

Directions: For #'s 5 - 8 evaluate the numerical expressions.

5.) $16 + 4(14 - 6)$	6.) $26 - [(25 - 11) - 2^3]$
7.) $(8^2 - 2^5) \div (24 \div 6) + 3^2$	8.) $\dfrac{36 - 3 \cdot 4}{15 - 9 \div 3}$

9.) Evaluate the algebraic expression $\dfrac{6x - y}{y^2}$ when x = 5, and y = 2.

10.) Evaluate the algebraic expression $\mathbf{w(3x)^2 - 3y^2}$ when w = 6, x = 3, and y = 10.

Directions: Identify each of the following:

16. $8x^2 + 10$ The constant is: 10	19. $5x - 3y - 4$ The constant is: −4
17. $9x^2 - 4x + 1$ The coefficient of the x^2 term is: 9	20. $7a + 9b - 2c + 4$ has 4 terms.
18. $x + 3y$ The coefficient of the x term is: 1	21. $8x^2 - 3x + 7y - 8z - 9$ has 5 terms.

Study for your mini quiz! Look at your notes.