

AIM: 2-3 I will be able to EVALUATE algebraic expressions!

Name _____
Mrs. Ashley

Date _____
Math 6 - Period _____

Warm-up: Simplify the following numerical expressions.

M/D/E/G
A/S

1) $4 + 7 \times 3 - 1$
 $4 + 21 - 1$
 $25 - 1$
 24

* 2) $6(9 + 2) + 7$
 $6 \cdot 11 + 7$
 $66 + 7$
 73

3) $35 \div 7 \times 5$
 $5 \cdot 5$
 25

M/D/E/G
A/S

or... $6 \cdot 9 + 6 \cdot 2 + 7$
 $54 + 12 + 7$
 73



Let's Investigate: Identifying and writing equivalent expressions.

Inflation is the rise in prices that occurs over time. For example, you would have paid about \$7 in the year 2017 for something that cost only \$1 in the year 2000.

2000	2017
$\$1 \cdot 7 =$	\$7
$\$2 \cdot 7 =$	\$14
$\$3 \cdot 7$	\$21
$\$p \cdot 7$	$\$p \times 7$

→ algebraic or $7p$ expression

A variable is a letter or symbol that represents a quantity that can change. In the table above, p is the variable that represents the price in 2000.

A constant is a quantity that does NOT change. In the table above, the price of an item in 2017 is always 7 times the price in 2000. (A number) No variables

An algebraic expression contains one or more variables and may contain operation symbols (+, -, x, ÷). In the table, $p \times 7$ is an algebraic expression.

(no = sign!)

Examples:

Numeric Expression

Algebraic Expression <i>variables</i>	NOT an Algebraic Expression <i>No variables</i>
$150 + y$	$85 \div 5$
$35w + 2$	$10 + 3 \times 5$
$2x + y$	$2 + 4 - 2$
Make your own: $5y + x^2$, $3n + y$ $3 + y$	Make your own: $33 \cdot 9 - 4$, $24 \div 6$

A **COEFFICIENT** is the **number in front of a variable**. In the expression $3x$, the **3** is the coefficient. If a variable does not have a number in front of it, the coefficient is 1. $\rightarrow \underline{3}x$ $\underline{1}y + 8$

When addition or subtraction separates an algebraic expression into parts, each part is called a **TERM**. (Example: $3x + 4$; $3x$ is a term, 4 is a term)

$3x, 4$ $3x \oplus 4$ - 2 terms - $3x \ominus 4$ $3x, -4$

KEY CONCEPT 1: Identify Terms, Coefficients, and Constants in algebraic expressions

$$6n^2 \oplus 7n \ominus 4$$

a) How many terms are there? 3 List each term. $6n^2, 7n, -4$

b) List the COEFFICIENTS: 6, 7

c) List the CONSTANTS: -4

 **Now You Try!**

$$5n^3 \ominus 2n \oplus 8 \oplus 5n$$

a) How many terms are there? 4 List each term. $5n^3, -2n, 8, 5n$

b) List the COEFFICIENTS: 5, -2, 5

c) List the CONSTANTS: 8

KEY CONCEPT 2: Evaluate Algebraic Expressions

To evaluate an algebraic expression, substitute the number for the variable and then find the value.

Mrs. Ashley's favorite mistake: Evaluate $2x$ when $x = 3$

23 or $2 \cdot 3$

$2x$ means
2 times x
 $2 \cdot x$

Examples: Evaluate each expression below for the given variable.

1) Evaluate each expression when $x = 3$ Show your work & substitutions!

a) $5x + 1$ $5 \cdot 3 + 1$ $15 + 1$ $\underline{\underline{16}}$	b) $5(x + 1)$ $5 \cdot (3 + 1)$ $5 \cdot 4$ $\underline{\underline{20}}$	c) $x^2 + 5x$ $3^2 + 5 \cdot 3$ $9 + 5 \cdot 3$ $9 + 15$ $\underline{\underline{24}}$
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Sum:
60

2) Evaluate each expression for the given variable. Show your work & substitutions!

a) $6n + n^2$, when $n = 5$ $6 \cdot 5 + 5^2$ $6 \cdot 5 + 25$ $30 + 25$ $\underline{\underline{55}}$	b) $\frac{16}{g}$, when $g = 4$ $\frac{16}{4} \rightarrow 16 \div 4$ $\underline{\underline{4}}$	c) $0.5x + 6$, when $x = 6$ $0.5(6) + 6$ $3 + 6$ $\underline{\underline{9}}$
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Sum:
68

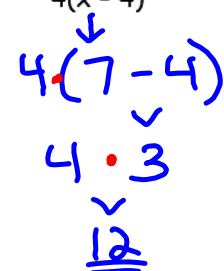
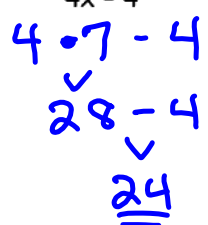
3) Evaluate each expression when $a = 3$, $b = 4$, and $c = 6$ Show work & substitutions!

a) $ab - c$ $3 \cdot 4 - 6$ $12 - 6$ $\underline{\underline{6}}$	b) $c^2 - b$ $6^2 - 4$ $36 - 4$ $\underline{\underline{32}}$	c) $a^3 - (b + c)$ $3^3 - (4 + 6)$ $3^3 - 10$ $27 - 10$ $\underline{\underline{17}}$
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Sum:
55

SUMMARY:

4) Evaluate each expression below when $x = 7$

a) $4(x - 4)$  $4(7 - 4)$ $4 \cdot 3$ 12	b) $4x - 4$  $4 \cdot 7 - 4$ $28 - 4$ 24
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Are your answers for #1 and 2 the same? Explain why or why not.

The answers are different because order of operations changes the order you do the steps. In problem A you must first subtract inside the parenthesis and in problem B you must first multiply.

The **TAKEAWAY**

A **VARIABLE** is a letter or symbol that represents a quantity that can change. Common variables are x , y , n , p .

A **CONSTANT** is a quantity that does NOT change. A number.

An **ALGEBRAIC EXPRESSION** contains one or more variables and may contain operation symbols. (+, -, \times , \div).

$$2n + 1; \quad x^2 + 2x + 4; \quad 3p$$

A **COEFFICIENT** is the **number** in front of a variable.

In the expression $2y + 5$, 2 is the coefficient, 5 is the constant.

When addition or subtraction separates an algebraic expression into parts, each part is called a **TERM**. Example: $3x + 4$; $3x$ is a term, 4 is a term.

To evaluate an algebraic expression, substitute the number for the variable and then find the value. (Example: Evaluate $3x$ when $x = 3 \rightarrow 3 \cdot 3 \rightarrow 9$)