

Variables and Expressions Guided Notes

A numerical expression is a mathematical phrase that contains only constants and/or operations.

To evaluate a numerical expression, you find its numerical value.

Sample Problem 1: Find the value of each numerical expression. Follow the order of operations when finding each value.

a. $12 + 10 \div 2 - 4 =$

b. $20 \div 10 + 6 =$

c. $12 * 2 - 6 \div 3 =$

A variable expression is a mathematical phrase that may contain variables, constants, and/or operations.

A variable is a letter that is used to represent one or more numbers. The letters x and y are used very often as variables in algebra, but variables can be any letter (z, k, l, m, n , etc.).

Any number not joined to a variable is called **a constant**. It's called that because its value doesn't change, even if the value of the variable changes.

Each algebraic expression is made up of **terms**.

A term can be a signed number, a variable, or a constant multiplied by a variable or variables.

Each term in an algebraic expression is separated by a + sign or a – sign.

When a term is made up of a constant multiplied by a variable or variables, that constant is called **a coefficient**.

Example:

$5x + 7$

The terms having the same algebraic factors are called **like terms**.

The terms having different algebraic factors are called **unlike terms**.

Expression with one term is called **a monomial**, with two unlike terms is called **a binomial**, in general, an expression with one or more than one term (with nonnegative integral exponents of the variables) is called **a polynomial**.

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Sample Problem 2: Find the terms, constant/s and coefficient/s for each expression.

a. $2x - 10$

Terms:**Variable:****Constant:****Coefficient:**

b. $x + 4y + 32$

Terms:**Variable:****Constant:****Coefficients:**

Expressions are like instructions that tell you what you have to do to a number or variable.

Expressions are used to write word problems in math terms.

Sample Problem 3: Write an algebraic expression for each verbal phrase.

a. A number minus 10

b. The product of a number and 6

c. 12 less than a number

d. 16 plus a number

e. The sum of n and 8, divided by 4

f. 4 more than 2 times a number

Substituting Values into Algebraic Expressions

To evaluate an algebraic expression, you substitute values for the variables and then simplify the resulting numerical expression.

Sample Problem 4: Evaluate each expression using the values given.

a. $x + y$ **when** $x = 2$ and $y = 6$

b. $3x - 4y$ **when** $x = 7$ and $y = 1$

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c. $10a - 4(2 + b)$
when $a = 7$ and $b = 2$

Sample Problem 5: If $a = 8$, $b = 3$, and $c = 6$, evaluate the following by substituting these values into the following expressions.

a. $a + 4b \div c =$

b. $4a + 2bc - 3 =$

c. $\frac{3a + 2b}{c} =$