Math-2: Lesson 1-1 (Basic Vocabulary and Properties)

"Expression" (a math "phrase") A name or a symbol for a number

4 x + 3 3x + 4y - 2

Do you see an equal sign in an expression?

"Statement" (a math sentence) A meaningful assertion that is either true or false.

The most common "statement" is an equation. x + 3 = 5

Another "statement" could be an inequality. x + 3 ≤ 5

Equivalence?

Consult with your neighbor to define "equivalence" as it applies to mathematics.

Fill in the blank: −4 + 7 =_____

Are there any other possible "equivalences"?

$$\text{"3"} = \{3, \frac{6}{2}, \frac{3x}{x}, (5-2), \ldots\}$$

Equivalent Equation An equation that means the same thing (has the same "solution") as the first equation.

x = 2 and 2x = 4 are equivalent equations.

Solution: the number (or numbers) that when substituted in for the unknown value will make the statement true. 3x + 4 = 7 Is 5 a solution of the equation?

Does the equation have more than one solution?

Can an expression have a solution?

Are expressions math statements?

"Variable" vs. "Unknown Value"

variable: A letter or symbol can have many values as the solution.

x + 3 = 5

'x' is an unknown value

What number does 'x' represent?

3x + 4y = 12

'x' and 'y' are the variables

What numberS do 'x' and 'y' represent?

Your turn: What is it?

a. Statement
b. Equation
c. expression

1. 3 + 4 – 1 = 6
2. x + 2y
3. ax + by > c

Terms The individual numbers in an expression or an expression or equation.

4x	x + 3	3x + 4y - 2
1 term	2 terms	3 terms
"Monomial"	"Binomial"	"Trinomial"

Coefficient The number in front of a variable in an expression or an equation.

3x + 4y - 2

3 is the coefficient of 'x'

4 is the coefficient of 'y'

Constant A term in an expression or an equation that does not contain a variable

3x + 4y - 2 ← -2 is a constant (it's "constantly" -2 regardless of the values of 'x' or 'y')

2x + 3 = 5 Both 3 and 5 are constants

Your Turn: 2x + 5y - 4

4. What type of "nomial" is this? (mon-, bi-, tri-)
5. List the coefficients
6. List the variables
7. Is this an expression or an equation?
8. List the constants
9. How many terms are there?
10. What is the solution of the expression?

Sum The answer when you add two or more numbers together.

2 + 3 = 5

Addends The numbers that are added together to get the sum.

Factors The numbers that are multiplied together to get an equivalent value.

2 x 3 = 6

"Product" The equivalent value of factors multiplied together.

Quotient The equivalent value of one number divided by another number.

$6 \div 3 = 2$

Divisor The number that divides the dividend.

Dividend The number that is being divided.

11. What is this called?

$$\frac{10}{5} = 2$$

13. What is this called?

12. What is this called?

Your turn:

Name the circled item (correct vocabulary needed)

14. $2 + (3) = 5$

15. $2 + 3 = (5)$

16. $2 * (3) = 6$

17. $7 * 8 = (56)$

Mathematical Property: a general rule that, when applied to an expression or an equation, results in an **equivalent** expression or equation.

We use properties to rewrite expressions and equations as in equivalent more-simplified forms.

The following properties are so easy, that you have been applying them without even thinking about them.

You must know the name of each property and be able to give an example of its use.

Identity Property of Addition

Adding zero to a number results in the original number being the sum.

$5 + 0 = 5$

Think: "zero added to any number will not change the "identity" of the number."

Inverse Property of Addition

Adding a number so its "opposite" (sign) results in zero as the sum.

$5 + (-5) = 0$

Think of the additive inverse of a number as the "opposite" or "negative" of the number.

What is the additive inverse of -22? of 2/3?

Identity Property of Multiplication

Multiplying any number by one results in the original number being the product.

$5(1) = 5$

Think: "one multiplied by any number will not change the "identity" of the number."

Inverse Property of Multiplication

Any number multiplied by its reciprocal will always is equivalent to '1'.

$5 \times \frac{1}{5} = 1$

Any number divided by itself always is equivalent to '1'.

$5 \div 5 = 1 \qquad \frac{5}{5} = 1$

5 is the "reciprocal" of 1/5
And
1/5 is the reciprocal of 5.

What is the multiplicative inverse (reciprocal) of 1/7?

Your turn:

16. What number do we multiply "3" by to change it into a "1" ?

17. What number do we mulitiply "5y" by to change it into a "y" ?