-- Chapter 2 Pre-Algebra --

Topics and Examples

Evaluating variable expressions using substitution

To evaluate variable expressions with substitution means you must "plug in" or substitute a number for variables like "x" and "y". To solve these types of problems, you must plug in what value of x they give you, into the expression. For example, if you are given the variable and expression: x=5 and 2+x=?, you would put 5 for x instead of just x since x is the same as 5, as indicated by x=5.

Example:

1. Calculate the following expression for x=10 and 2x+2=?
   Step 1: 2(10) + 2 = ?
   Step 2: 20 + 2 = 22

2. Calculate the following expression for x=2
   5x + 1 = ?
   Step 1: 5(2) + 1 = ?
   Step 1: 10 + 1 = 11

Possible mistakes: You may add the value of "x" when, in reality, it wants you to multiply. If the problem has a number attached to an x, that means the two numbers are being multiplied, for example "5x".

Solving one step equations

Solving one-step equawtions using addition, subtraction, multiplication, and division can be done by getting "x" by itself. For example, if you're given 5x+2 = 10, to get x by itself, you'd first subtract 2 on both sides and then divide by 5 on both sides to get x by itself.

Example:

1. Solve the following equation for x:
   2x + 6 = 10
   Step 1: 2x + -6= 10-6
   Step 2: 2x = 4
   Step 3: 2x/2 = 4/2
   Step 4: x = 2

2. Solve the following equation for x:
   5x + 3 = 13
   Step 1: 5x 3 - 3= 18 - 3
   Step 2: 5x/5 = 15/5
   Step 3: x = 3

Reminder: You must get the term with x to be by itself and the last step should always be to divide or multiply to get x by itself.

Topics and Examples

Converting word problems into equations

Word problems can be solved by converting them into equations. You must be able to understand the problem and put it into a solvable equation.

Examples:

1. Jean has five times as many marbles as Bob, Bob has 10 marbles, how many marbles does Jean have?

   In this problem, since it says "five times", you know you must multiply something by 5. Since you're only given enough information to create the expression "5x", you know that "x" must equal ten because that is the only other information given to you. By subbing in 10 for x, you know Jean has 50 marbles.
   - 5x = ? -> 5(10) = 50

2. In a classroom, there are 7 groups of desks, and each group has the same number of desks. The math teacher distributes one calculator to each desk. If out of 37 calculators all but 2 are distributed, how many desks are in each group?

   For this problem you can make x the number of desks per group because it is the unknown variable and since there are 7 groups, you can multiply "x" by 7. The total amount of desks is equal to 7x since a calculator is being distributed to every desk, 7x can equal 37-2 since there are 2 extra. The equation you must solve is 7x = 35. Divide by 7 on both sides and you will get x = 5.
   - 7x = 35 -> 7x/7 = 35/7 -> x = 5