Equations Worksheet 1

The language of MATH is Equations!!!

Every step in solving a problem for an unknown variable should have a equation sign in it.
General concept: get the variable on one side and the numbers on the other side. To move something we do the opposite sign of it.

<u>Properties of Equality</u> (commonly used to solve problems)

Property	Result	Example
Distributive	Removes parentheses	$3(x + 2) = 3x + 3\times2$ $= 3x + 6$
Addition	Adds same value to both sides	$3x - 6 = 21$ $+6 = +6$ $3x = 27$
Subtraction	Subtracts same value from both sides	$4x + 7 = 23$ $-7 = -7$ $4x = 16$
Multiplication	Multiplies both sides by the same value	$\frac{1}{2} x = 8$ $2(\frac{1}{2} x = 8)$ $x = 16$
Division	Divides both sides by the same value	$4x = 16$ $\frac{4x}{4} = \frac{16}{4}$ $x = 4$
Before you can use the properties of equality (except for distribution), we may need to combine like terms (CLT):		
CLT	Group variables and numbers on each side of equation together	$3x - 9 + 2x - 8 = 23$ $5x - 17 = 23$

Find the unknown variable usually involves application of several of the properties of above to get the solution.

<u>Common mistakes:</u>
Combine variables and numbers (not like terms)
Not using the opposite to eliminate a term:
add to remove negative;
subtract to remove positive;
divide to remove the coefficient in front of the variable

Name: _____

Problems:

Warm-ups:

$x + 8 = 17$ $3x = 15$ $x - 7 = 3$

$6x + 9 = 51$ $2x - 7 = 11$ $3x + 1 = 10$

Multiple Steps:

$5x + 8 = 3x + 18$ $3x - 3 = 15 - 3x$ $3x - 7 = 3 + x$

$6x + 9 = 45 + 3x$ $2x - 7 = 11 - 4x$ $6x + 1 = 10 - 3x$

CLT first:

$(2x + 5) + (2x + 4) = 45$ $2x - 7 + 3x = 11 + x + 2$ $(3x + 10) + (7x - 30) = 180$