# Study Guide

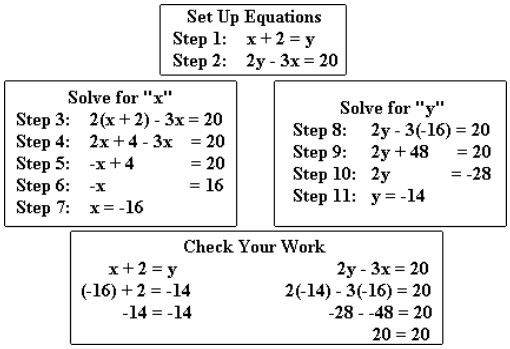
Number Relation Problems
02/29/2012

**Number Relation Problems**
Number relation problems involve sentences that must be translated into equations.

To translate sentences, review the following phrase/number equivalences:

If x is equal to 4, then x = 4
If the sum of 2x and 2y is 23, then 2x + 2y = 23
If 3 is less than twice y, then 2y > 3
If 5x decreased by y is more than 2y, then 5x - y > 2y
If the result of 7 more than 3 times x is y, then 3x + 7 = y

**Example:** One number is 2 less than another number. If twice the larger number is decreased by 3 times the smaller number, the result is 20.




Step 1: Translate the first sentence in the problem into the first equation.
Let x and y represent the unknown numbers, with y representing the larger number and x representing the smaller number.
Step 2: Translate the second sentence in the problem into the second equation.
Use x and y as in the first equation, substituting them into their respective locations in the equation.
Step 3: Substitute x + 2 for y in the second equation.
Step 4: Distribute the 2 across (x + 2).
Step 5: Combine the similar terms.
Step 6: Subtract 4 from both sides.
Step 7: Divide each side by -1 to find the value of x.
Step 8: Using x = -16, substitute for x in the second equation.
Step 9: Multiply -3 and -16.
Step 10: Subtract 48 from both sides.
Step 11: Divide each side by 2.

Answer: x = -16 and y = -14

As always, check the solutions by substituting both equations with x = -16 and y = -14.