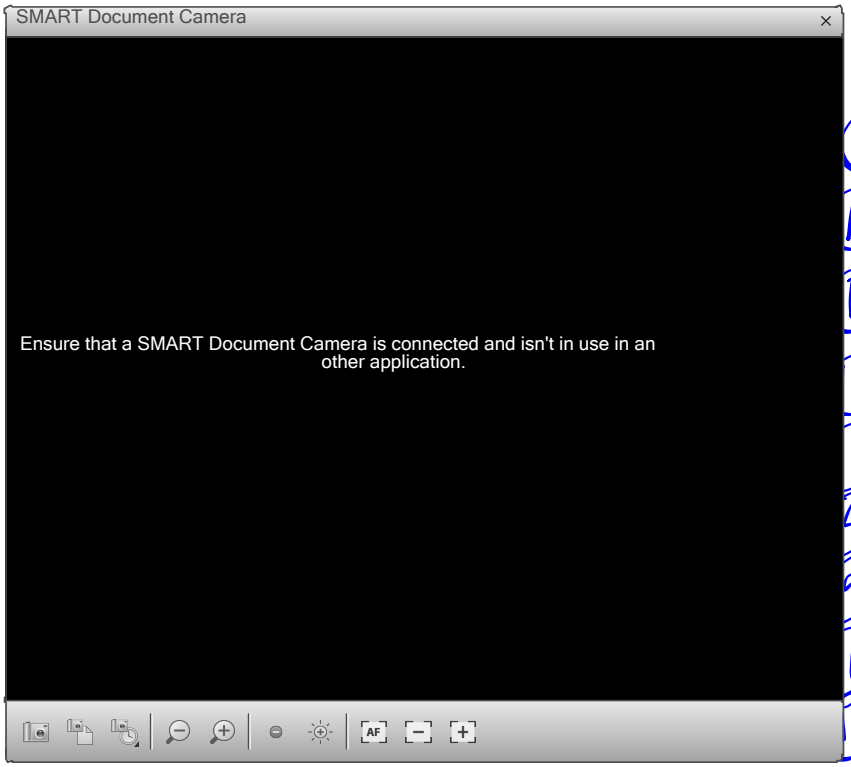
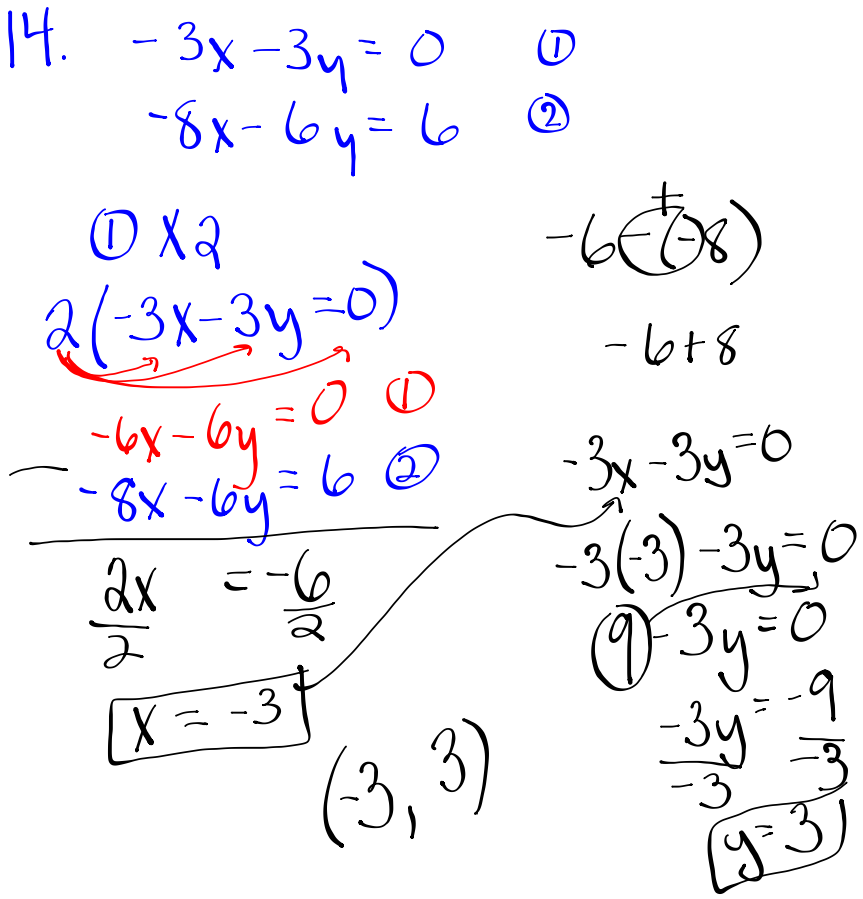
Systems of Equations Word Problems



9) (6,10)
10) (-8,-2)
11) (6,-7)
2) (10,-1)
3) (-7,7)
4) (-3,3)
5) Infinite sol
6) (4,-1)
7) (3,1)



Translating Words into Mathematical Expressions

Many problems can be solved using mathematical methods. In order to do this, we must be able to change words into mathematical expressions and equations.

Example:

Write the following as algebraic expressions with one variable

a) 3 times a number $3n$

b) a number increased by 4 $n+4$

c) Six times a number decreased by 2 $6n-2$

Find the unkown quantity using an equation.

A number increased by 35 is 82. What is the number?

Steps:
1) Introduce the variable
2) Set up the equation
3) Solve

A number = q

$q + 35 = 82$

$-35 \quad -35$

$q = 47$

Solving Problems in 2 variables

Some problems of business and industry are solved by expressing the problems as a system of equations.

Example 1:

The sum of two numbers is thirty and their difference is 174. Find the numbers.

a is a #
b is a #

$a + b = 30$ (1)

$-\ a - b = 174$ (2)

$2b = -144$

$\frac{2b}{2} = \frac{-144}{2}$

$b = -72$

$a + b = 30$

$a + (-72) = 30$ $+72$ $+72$

$a = 102$

Example 2:

When 4 times the larger of 2 numbers is added to 3 times the smaller the result is 68. Seven times the larger less 5 times the smaller is 37. Find the numbers.

l = large #

s = small #

$4l + 3s = 68$ (1)

$7l - 5s = 37$ (2)