Today's Plan:

Learning Target (standard): I will solve systems of equations using the substitution and elimination methods.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

Assessment: Board work, homework check and homework assignment

Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

Graphing Method:

1) $independent$ $(3,3)$

2) $inconsistent$ no solution

3) $independent$ $(1,3)$

4) $independent$ $(-2,1)$

5) $independent$ $(4,2)$

6) $independent$ $(1,-1)$

7) $independent$ $(-1,1)$

8) $dependent$ infinite solutions

Solve using the graphing method.

① $x - 3y = -9$ $-3y = -x - 9$

② $2x - y = 2$ $y = \frac{1}{3}x + 3$

$-y = -2x + 2$ $m = \frac{1}{3}$

$y = 2x - 2$ $I_y : (0, 3)$

$M = 2$ independent

$I_y : (0, -2)$ $(3, 4)$
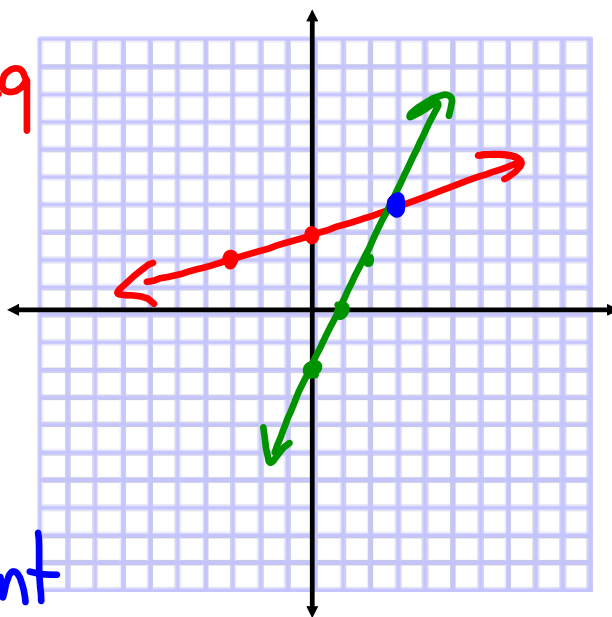
Solve using the graphing method.

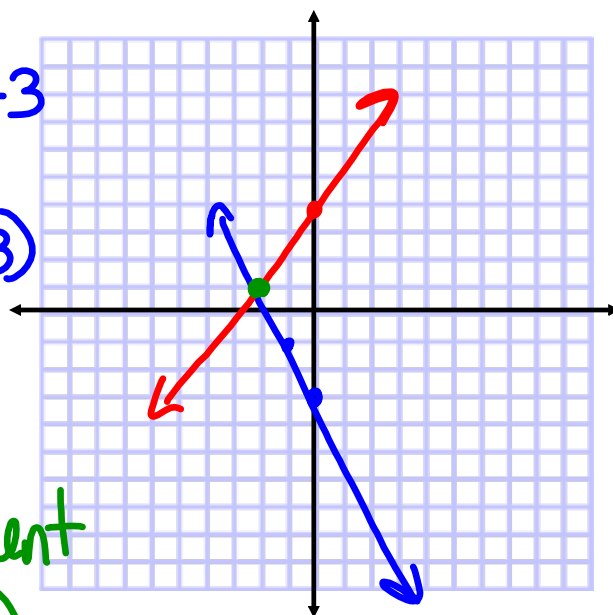① $2x + y = -3$ $y = -2x - 3$

② $3x - 2y = -8$ $m = -2$

$-2y = -3x - 8$ $I_y : (0, -3)$

$y = \frac{3}{2}x + 4$

$m = \frac{3}{2}$ independent

$I_y : (0, 4)$ $(-2, 1)$

Solve each system using the graphing method:

① $3x + y = 5$ $y = -3x + 5$

② $2x + 3y = 8$ $m = -3$
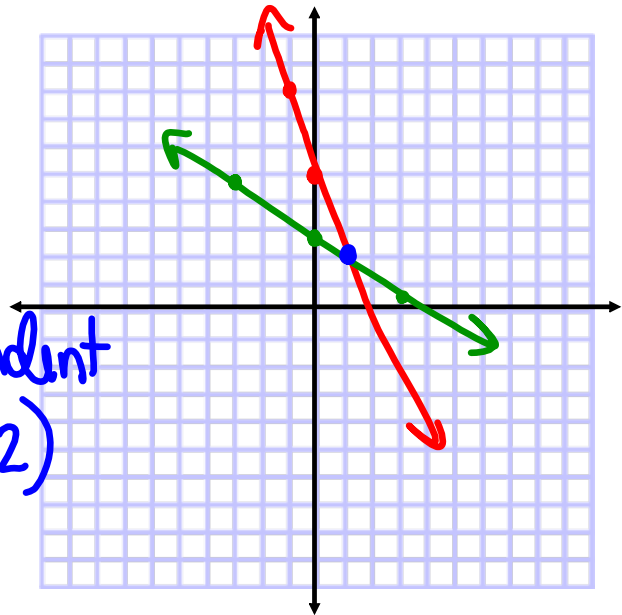
$3y = -2x + 8$ $I_y: (0, 5)$

$y = -\frac{2}{3}x + \frac{8}{3}$

$m = -\frac{2}{3}$

$I_y: (0, \frac{8}{3})$

independent

$(1, 2)$

Substitution Method:
- Still only three types of solutions
- Method for getting the solution is different
- Graphing method would be difficult to use and get an exact solution if the ordered pair is not based on integers

Substitution Method:
- Choose one of the equations and solve it for either variable
- Use the "value" of the variable to substitute into the other equation
- Solve for the variable

$$3x - 3y = 2$$
$$y - x = 2$$
$$y = x + 2$$

$$3x - 3(x+2) = 2$$
$$3x - 3x - 6 = 2$$
$$-6 \neq 2$$

inconsistent
no solution

Types of Systems using the Substitution Method:
- Independent - either variable can be solved for and a real value is the result
  $$x = 3 \text{ or } y = -5$$

- Inconsistent - a false statement results with no variables present
  $$-3 = 6 \text{ or } 0 = 2$$

- Dependent - a true statement results with no variables present
  $$7 = 7 \text{ or } -1 = -1$$

Solve each system using the substitution method:

$$3x + y = 5 \quad \boxed{y} = -3x + 5$$

$$2x + 3y = 8$$

$$y = -3(1) + 5$$
$$y = 2$$

$$2x + 3(-3x + 5) = 8$$

$$2x - 9x + 15 = 8$$

$$-7x = -7$$

$$x = 1$$

independent

$$(1, 2)$$

Elimination Method:

- equations should be in standard form Ax + By = C

- choose one variable to be eliminated

- get the coefficients on that variable to be additive inverses of one another

- add the equations so that the variable is eliminated

Types of Systems using the Elimination Method:

- Independent - either variable can be solved for and a real value is the result
  $$x = 3 \text{ or } y = -5$$

- Inconsistent - a false statement results with no variables present
  $$-3 = 6 \text{ or } 0 = 2$$

- Dependent - a true statement results with no variables present
  $$7 = 7 \text{ or } -1 = -1$$

Solve using the elimination method.

$$3\left(3x + 7y = 16\right)$$
$$7\left(4x - 3y = 9\right)$$

$$9x + 21y = 48$$
$$28x - 21y = 63$$
$$\overline{}$$
$$37x = 111$$
$$x = 3$$

$$12 - 3y = 9$$
$$-3y = -3$$
$$y = 1$$

independent
$$(3, 1)$$

Solve using the elimination method.

$-2(x - 3y = -9)$ $-2x + 6y = 18$ $2x - 4 = 2$

$2x - y = 2$ $2x - y = 2$ $2x = 6$

independent $5y = 20$ $x = 3$

$(3, 4)$ $y = 4$

Solve using the substitution method.

$x - 4y = 12$ $x = 4y + 12$

$x - 4y = -4$

                              $(4y + 12) - 4y = -4$

inconsistent $12 \neq -4$

no solution

Assignment:

Substitution & Elimination
#1-8