

Bell Work:

Solve The Systems Using Any Method

$$1.) \quad 3x - y = 8$$

$$4x - 2y = -1$$

$$2.) \quad 2y - x = -4$$

$$-2x + 4y = -8$$

From Last Time

Page 138 #1, 2, 3, 11, 29, 39

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Mixed Review


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ALGEBRA 3

Day 25



Objective: To solve a system of equations by graphing (3.1) or algebraically (3.2)

To apply knowledge of solving systems of equations to solving systems of inequalities (3.3)

Review:

3.1 – Solving Systems Using Graphs

■ **System of Two Linear Equations:** consists of two equations

– *Equation 1:* $Ax + By = C$; or $y = m_1x + b_1$

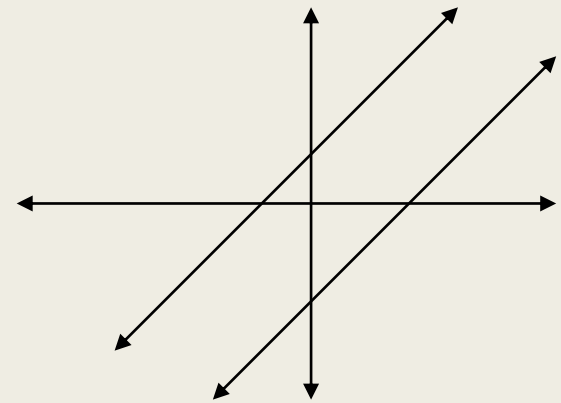
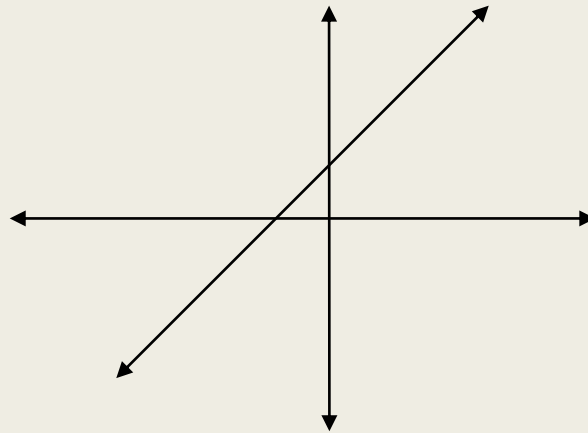
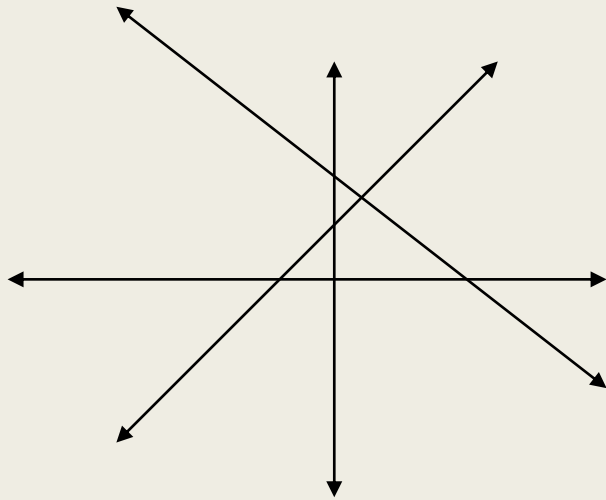
– *Equation 2:* $Dx + Ey = F$; or $y = m_2x + b_2$

Solution: an ordered pair (x, y) that satisfies **BOTH** equations

Review:

Number of Solutions of a Linear System

Describe the number of solutions below.



Note: There are two lines here.
They are on top of each other

Review:

Steps to Solving by Graphing:

- 1.) Rewrite each equation of the system in slope intercept form. ($y = mx + b$)
- 2.) Graph each equation. (Use your calculator!)
- 3.) Find the intersection. (Refer to chart above for one, zero or infinite solutions).

Review:

3.1 – Solving Systems Algebraically

■ **System of Two Linear Equations:** consists of two equations

– *Equation 1:* $Ax + By = C$; or $y = m_1x + b_1$

– *Equation 2:* $Dx + Ey = F$; or $y = m_2x + b_2$

Solution: an ordered pair (x, y) that satisfies **BOTH** equations

Review:

Substitution Method

(Best used when lead coefficient is 1 or -1)

- 1.) Solve for the variable with coefficient of 1 or -1
- 2.) Substitute in the expression from Step 1 into the other equation for that variable and solve.
- 3.) Substitute the answer from Step 2 into the revised equation from Step 1 and solve for the other variable.
- 4.) Check your solution (x,y) by substituting back into the original equation.

Example

$$3x + 4y = -4$$

$$x + 2y = 2$$

← solve for x (coefficient of 1)

Review:

Elimination Method

- 1.) Multiply one or both of the equations by a constant to obtain coefficients that differ only in sign for one of the variables
(i.e. *equal coefficients, but opposite signs*)
- 2.) Add the revised equations (known as **Equivalent Systems**) from Step 1. Combining like terms will eliminate one of the variables. Solve for the remaining variable. (One variable will cancel out!)
- 3.) Substitute the value obtained in Step 2 into either of the original equations and solve for the other variable.
- 4.) Check solution (x, y) by substituting back into original equations

Example:

(None of coefficients are 1 or -1 so elimination is easiest)

$$2x - 4y = 13$$

$$4x - 5y = 8$$

3.3 Solving Systems of Inequalities (Graph)

- The process remains the same as yesterday with a small twist.
- Just like graphing single inequalities, we must shade on either side of the line.
- We are no longer looking for simply where the single point is that overlaps, but rather the entire shaded regions that overlap!
- Bonus: Our calculators can do it for us again!

Graph to Solve the Inequality:

1.) $3x - y \leq 8$

$$4x - 2y > -1$$

2.) $2y - x > -4$

$$-2x + 4y \geq -8$$

For Next Time

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