

**MAY 30, 2017**

**UNIT 4: SYSTEMS OF LINEAR  
EQUATIONS**

**7.2: SOLVING A SYSTEM OF  
LINEAR EQUATIONS  
GRAPHICALLY**

**M. MALTBY INGERSOLL**  
*NUMBERS, RELATIONS AND FUNCTIONS 10*



## **WHAT'S THE POINT OF TODAY'S LESSON?**

**We will begin working on the NRF 10 Specific Curriculum Outcome (SCO) "Relations and Functions 10" OR "RF10" which states:**

**RF10: "Solve problems that involve systems of equations in two variables graphically and algebraically."**



## What does THAT mean???

**SCO RF10 means that we will:**

- \* **model a situation using a system of linear equations**
- \* **relate a system of linear equations to the context of a problem**
- \* **determine and verify the solution of a system of linear equations graphically**
- \* **explain the meaning of the point of intersection of a system of linear equations**
- \* **determine and verify the solution of a system of linear equations algebraically**
- \* **explain, using examples, why a system of equations may have no solution, one solution or an infinite number of solutions**
- \* **explain a strategy to solve a system of linear equations**
- \* **solve a problem that involves a system of linear equations**



**HOMEWORK QUESTIONS???**  
**(Distance / Midpoint Worksheets)**

## **DEFINITION - SYSTEM OF LINEAR EQUATIONS:**

**Two equations of linear functions in the same two variables.**

**EXAMPLE:**  $12x + 24y = 780$   
 $x = y + 20$

**Systems of Linear Equations can be solved GRAPHICALLY (7.2) and also by using SUBSTITUTION (7.4) and ELIMINATION (7.5).**

**Solving Systems  
of Linear  
Equations  
Graphically:**

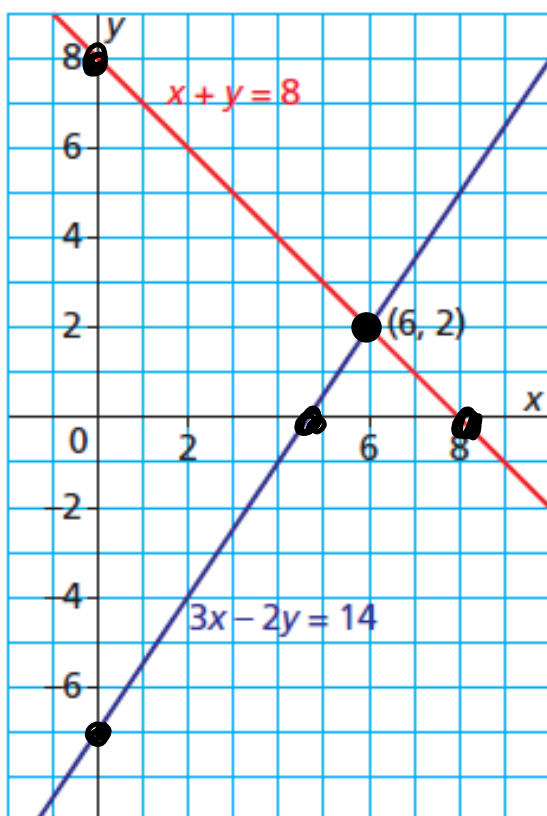
Solve this linear system.

$$x + y = 8$$

$$(x\text{-int.} = 8 ; y\text{-int.} = 8)$$

$$3x - 2y = 14$$

$$(x\text{-int.} = 4\frac{2}{3} ; y\text{-int.} = -7)$$



The point of intersection appears to be (6, 2).

Verify the solution. In each equation, substitute:  $x = 6$  and  $y = 2$

**(6, 2) : Solution???**

$$x + y = 8$$

$$6 + 2 = 8$$

$$8 = 8$$

$$3x - 2y = 14$$

$$3(6) - 2(2) = 14$$

$$18 - 4 = 14$$

$$14 = 14$$

For each equation, the left side is equal to the right side.  
So,  $x = 6$  and  $y = 2$  is the solution of the linear system.

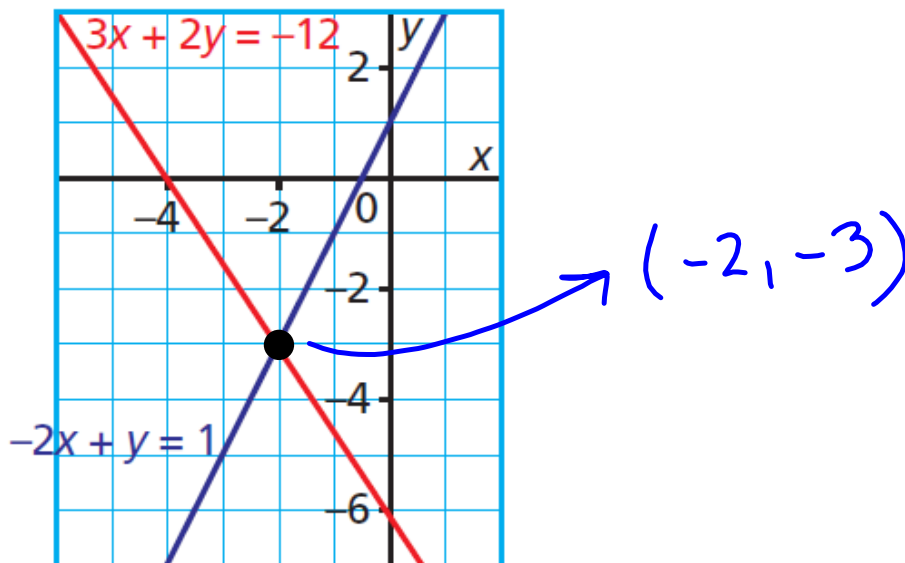
## SOLVING SYSTEMS OF LINEAR EQUATIONS GRAPHICALLY:

The solution of a linear system can be estimated by graphing both equations on the same grid. If the two lines intersect, the coordinates  $(x, y)$  of the point of intersection are the solution of the linear system.

Each equation of this linear system is graphed on a grid.

$$3x + 2y = -12 \quad \textcircled{1} \quad (\text{x-int.} = -4 ; \text{y-int.} = -6)$$

$$-2x + y = 1 \quad \textcircled{2} \quad (\text{x-int.} = -0.5 ; \text{y-int.} = 1)$$





**$(-2, -3)$  : Solution???**

$3x + 2y = -12$	$-2x + y = 1$
$3(-2) + 2(-3) = -12$	$-2(-2) + (-3) = 1$
$(-6) + (-6) = -12$	$4 - 3 = 1$
$-12 = -12$	$1 = 1$

For each equation, the left side is equal to the right side.

Since  $x = -2$  and  $y = -3$  satisfy each equation, these numbers are the solution of the linear system.

## **HOMEWORK:**

a) Write a linear system to model this situation:

To visit the Head-Smashed-In Buffalo Jump interpretive centre near Fort Macleod, Alberta, the admission fee is \$5 for a student and \$9 for an adult. In one hour, 32 people entered the centre and a total of \$180 in admission fees was collected.

b) Graph the linear system then solve this problem: How many students and how many adults visited the centre during this time?

## Attachments

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Worksheet - Review of Coordinate Geometry (Math 10).doc

area of a triangle.doc

coord geom review.doc

Puzzle Worksheet - Graphing #2 (Coffee).pdf

Puzzle Worksheet - Graphing #1 (Cow).pdf

Puzzle Worksheet - Slope Point (given both).pdf

Puzzle Worksheet - Slope Point (given two points).pdf

Worksheet - Equation of a Line.pdf

Worksheet Solutions - Equation of a Line.pdf

Worksheet - Distance\_Midpoint(2).pdf

Review - Coordinate Geometry.pdf