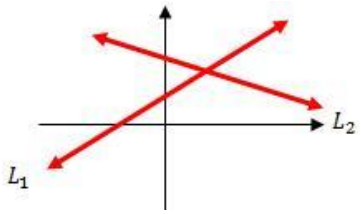
Lesson 2-1: Solving Systems of Equations in Two Variables. ***LO:*** I can solve a Linear System of Two Linear Equations Graphically and Algebraically.

EQ:

Date: _____

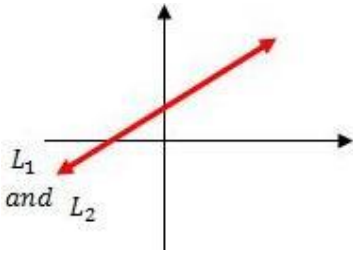
Number of Solutions of a Linear System (**Classifying the System**)

Intersecting Lines



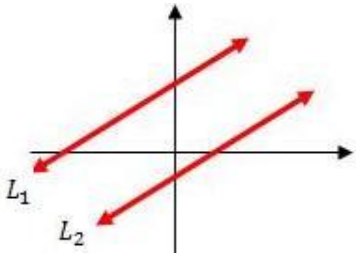
One Solution
different slopes &
different y-intercepts
Consistent & Independent System

Same Line



Infinite Solutions
same slope &
same y- intercept
Consistent & Dependent System

Parallel Lines



No Solution
same slope
but different y- intercepts
Inconsistent System

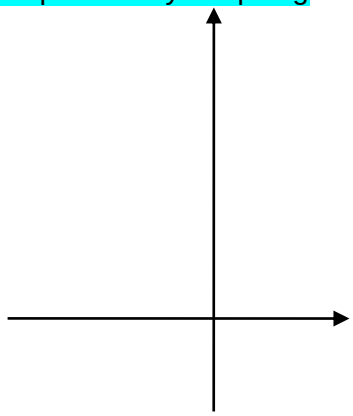
EX.1 – Solving a Linear System of Equations by Graphing.

a)

$$y = 3x + 7$$
$$y = \frac{1}{2}x + 2$$

x	y

x	y



Steps for graphing a System of Linear Equations

1. Rewrite equation in Slope – Intercept Form (y = mx + b) if needed.
2. Graph both equations on the coordinate plane
3. Determine what type of system you have & state your solution:

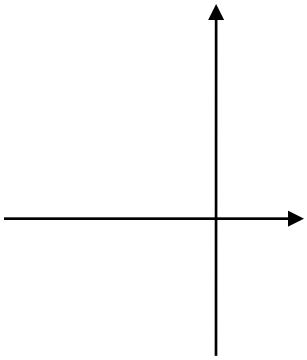
- If independent, **state & check your solution**
- If dependent, your answer is **Infinite Solutions**
- If Inconsistent, your answer is **No Solution**

b)

$$6x - 3y = -15$$
$$y = 2x - 3$$

x	y

x	y

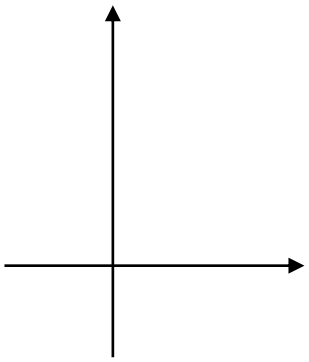


c)

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

x	y

x	y



Short Summary #1:

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EX 2. – Classifying a Linear System as Independent, Dependent or Inconsistent without Graphing.

Without Graphing, Classify each System as Consistent & Independent; Consistent and Dependent; or Inconsistent.

a)

$$-3x + y = 4$$
$$x - \frac{1}{3}y = 1$$

Steps:

b)

$$x + 4y = 12$$
$$2x - 8y = 4$$

c)

$$2x + y = 4$$
$$-6x - 3y = -12$$

Short Summary #2:

EX. 3 - Solving a Linear System Algebraically Using Substitution.

Steps:

Solve each system Algebraically, using Substitution.

a.) y = 3x
4x + 5y = 95

b.) a = 4b – 1
3b – 2a = -13

c.) n + 3p = -2
5n – 4p = 47

Short Summary #3:

Lesson 2-1: Solving Systems of Equations in Two Variables. ***LO:*** I can solve a Linear System of Two Linear Equations Graphically and Algebraically.

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EX. 4 - Solving a Linear System Algebraically Using Elimination.

Solve each System Algebraically, Using Elimination.

Steps:

a.) $x + 5y = -7$
$-2x + 3y = -25$

b.) $4x - 3y = -2$
$x + 3y = 7$

c.) $2a - 3b = -16$
$3a + 2b = 2$

Short Summary #4:

Lesson 2-1: Solving Systems of Equations in Two Variables. ***LO:*** I can solve a Linear System of Two Linear Equations Graphically and Algebraically.

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EX. 5 – APPLICATION – SOLVING LINEAR SYSTEMS RELATING TO REAL – WORLD SITUATION.

a.) At Renaldi's Pizza, a soda and two slices of the pizza – of – the – day cost $10.25. A soda and four slices of the pizza – of – the – day cost $18.75. Find the cost of each.

b.) You can buy CDs at a local store for $15.49 each. You can buy them at an online store for $13.99 each plus $6 for shipping. Write and solve a system of equations to find the number of CDs that you can buy for the same amount at the two stores.

c.) A bookstore took in $167 on the sale of 5 copies of a new cookbook and 3 copies of a new novel. The next day it took in $89 on the sale of 3 copies of the cookbook and 1 copy of the novel. What was the price of each book?

d.) A theater production costs $40,000 plus $2800 per performance. A sold-out performance brings in $3675. How many sold-out performances will the production need to break even?

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e.) **Geometry:** Two triangles have the same perimeter of 20 units. One triangle is an isosceles triangle. The other triangle has one side 6 units long, its other two sides have lengths the same as the base and leg of the isosceles triangle.

- What are the dimensions of each triangle?
- What type of triangle is the second triangle?

f.) The admission fee at a small fair is $1.50 for children and $4.00 for adults. On a certain day, 2200 people enter the fair and $5050 is collected. How many children and how many adults attended?

g.) A test has twenty questions worth 100 points. The test consists of True/False questions worth 3 points each and multiple choice questions worth 11 points each. How many multiple choice questions are on the test?

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g.) You are running a concession stand at a basketball game. You are selling hotdogs and sodas. Each hotdog costs $1.50 and each soda costs $2.50. At the end of the night, you made a total of $78.50. You sold a total of 87 hot dogs and sodas combined. You must report the number of hotdogs and sodas sold. How many hotdogs and sodas were sold?