Chapter 3 - Linear Equations and Functions

3.4 Objective: To solve **systems of equations** in **two variables**.

Agenda

1) Define - System of Equations
   Define - Solutions to a system
2) Model 4 Different ways to Solve a System
   - Algebraically (Substitution), Table, Graphically
     - Teacher
     - Students
   - Algebraically (Elimination), Table, Graphically
     - Teacher
     - Students

HW: Finish remaining examples of Different ways to Solve a System

Chapter 3 - Linear Equations and Functions

3.4 Objective: To solve **systems of equations** in **two variables**.

What is a system?

A ***system of equations*** is two or more equations with the same variables.

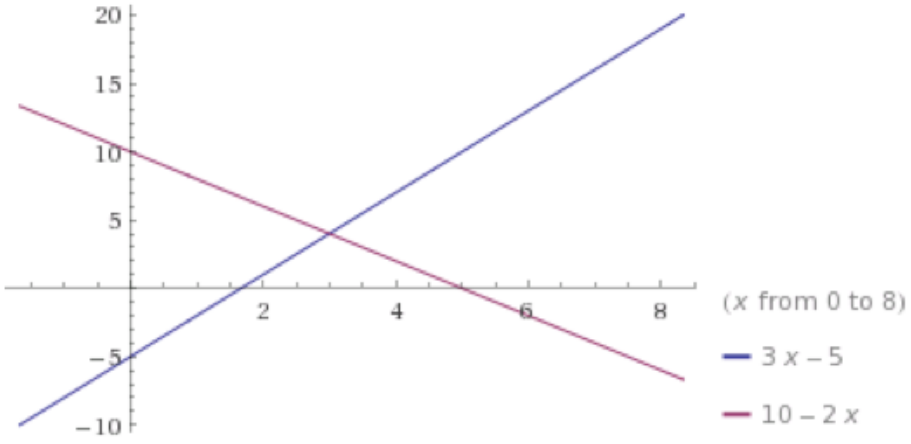
ex) y = 3x - 5 and y = -2x + 10

The **solution** to a system of equations is the ordered pair that makes **both** equations true.

ex) (3, 4)

The solution can also be found by looking at the graphs and finding the **point of intersection**.

ex) Plot:



The different ways to solve a system:

Algebraically: **Substitution**

1) y = 3x - 5 and y = -2x + 10

Table

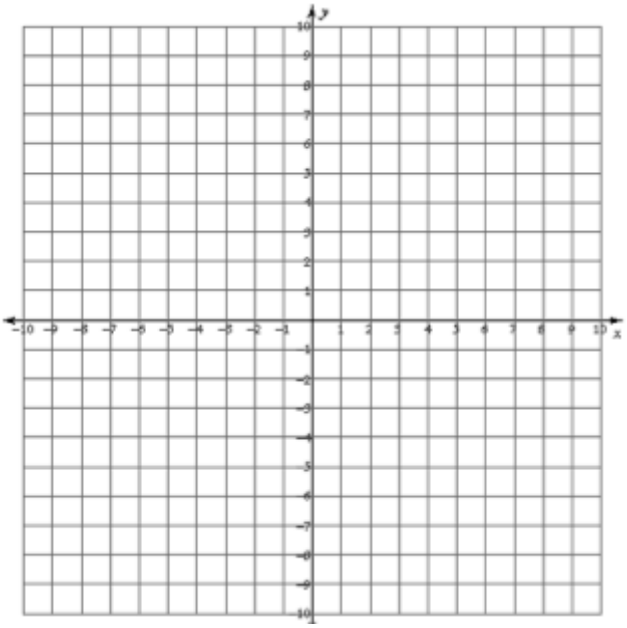
2) Fill in the table of values for each linear equation. Where do the tables have the same y-value?

x	y =3x - 5
0	
1	
2	
3	
4	

x	y = -2x + 10
0	
1	
2	
3	
4	

Graphically:

3) Use the table of values to graph both equations.



4) What's the point of intersection?

5) Verify that the x-value of the ordered pair is a solution to 3x – 5 = -2x + 10.

The different ways to solve a system:

Algebraically: **Substitution**

1) y = 3x - 11 and y = 10

Table

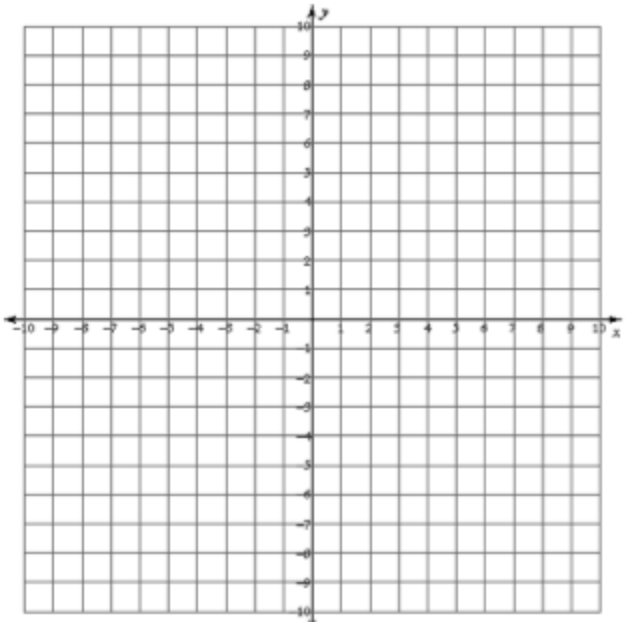
2) Fill in the table of values for each linear equation. Where do the tables have the same y-value?

x	y =3x - 11
3	
4	
5	
6	
7	

x	y = 10
3	
4	
5	
6	
7	

Graphically:

3) Use the table of values to graph both equations.



4) What's the point of intersection?

5) Verify that the x-value of the ordered pair is a solution to $3x - 11 = 10$.

The different ways to solve a system:

Algebraically: **Elimination**

1) 2x - 3y = -12 and 4x + 5y = 20

Table

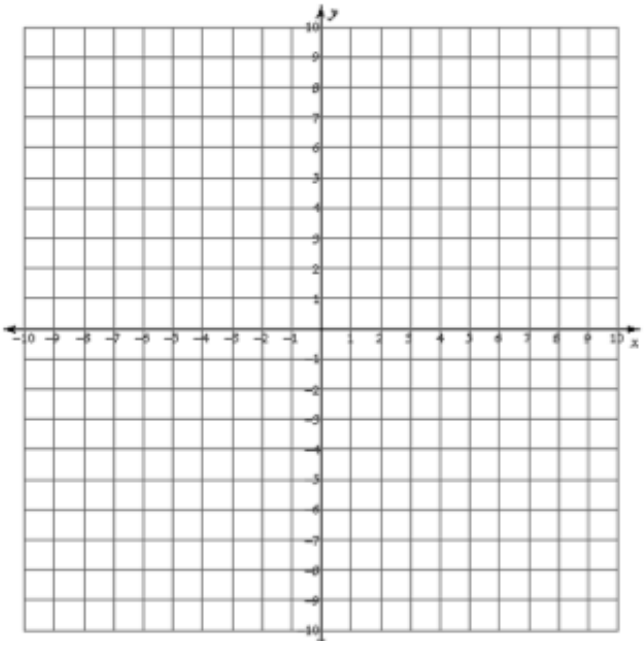
2) Fill in the table of values for each linear equation. Where do the tables have the same y-value?

x	2x - 3y = -12
-3	
-1	
0	
1	
3	

x	4x + 5y = 20
-3	
-1	
0	
1	
3	

Graphically:

3) Use the table of values to graph both equations.



4) What's the point of intersection?

5) Verify that the x-value of the ordered pair is a solution to 2x - 3y = -12 and 4x + 5y = 20

The different ways to solve a system:

Algebraically: **Elimination**

1) 2x - 3y = -16 and 5x +3y = -19

Table

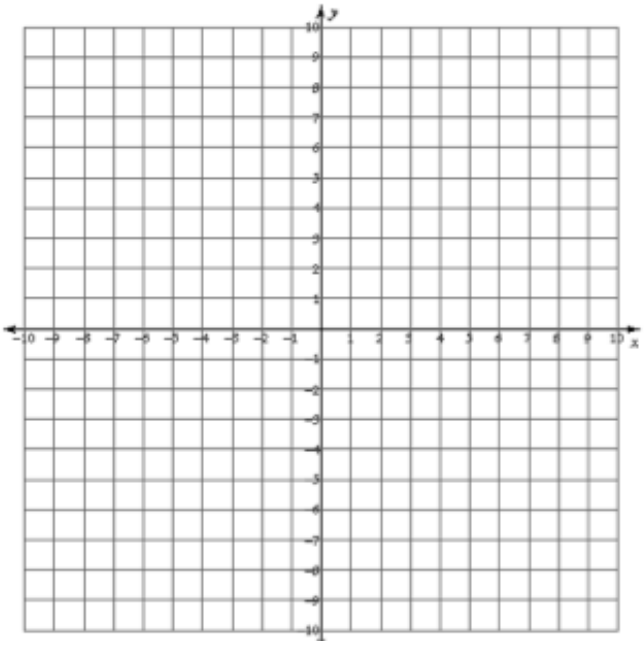
2) Fill in the table of values for each linear equation. Where do the tables have the same y-value?

x	2x- 3y = -16
-8	
-5	
0	
5	
8	

x	5x +3y = -19
-8	
-5	
0	
5	
8	

Graphically:

3) Use the table of values to graph both equations.



4) What's the point of intersection?

5) Verify that the x-value of the ordered pair is a solution to
2x - 3y = -16 and 5x +3y = -19

The different ways to solve a system:

Algebraically: **Substitution**

1) y = 4x +5 and y = -3

Table

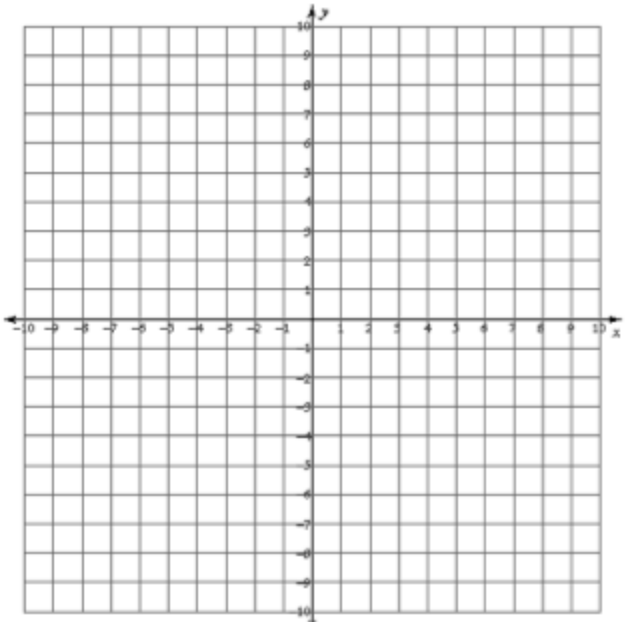
2) Fill in the table of values for each linear equation. Where do the tables have the same y-value?

x	y =4x + 5
-4	
-3	
-2	
-1	
0	

x	y = -3
-4	
-3	
-2	
-1	
0	

Graphically:

3) Use the table of values to graph both equations.



4) What's the point of intersection?

5) Verify that the x-value of the ordered pair is a solution to 4x +5 = -3.

The different ways to solve a system:

Algebraically: **Elimination**

1) 2x + y = 0 and 5x + y = 3

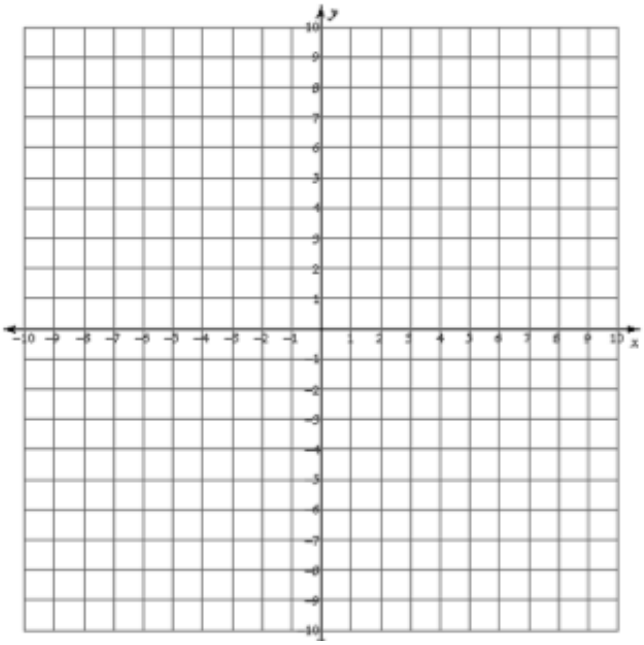
Table

2) Fill in the table of values for each linear equation. Where do the tables have the same y-value?

x	2x + y = 0	x	5x + y = 3
-2		-2	
-1		-1	
0		0	
1		1	
2		2	

Graphically:

3) Use the table of values to graph both equations.



4) What's the point of intersection?

5) Verify that the x-value of the ordered pair is a solution to 2x + y = 0 and 5x + y = 3

The different ways to solve a system:

Algebraically: **Substitution**

1) $y = -\frac{1}{2}x + 6$ **and** $y = \frac{3}{2}x + 10$

Table

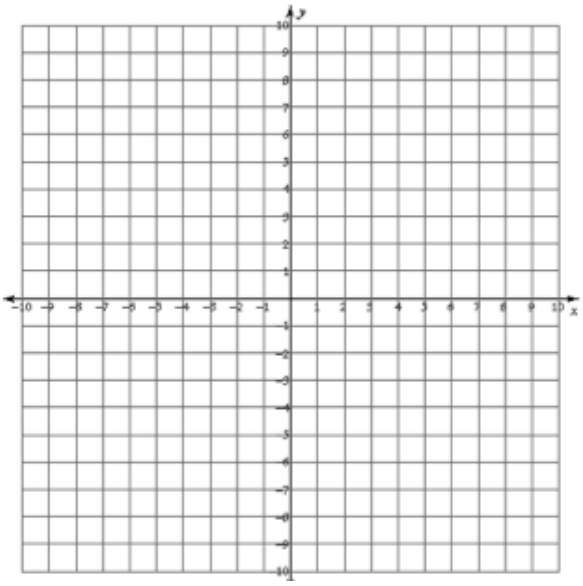
2) Fill in the table of values for each linear equation. Where do the tables have the same y-value?

x	$y = -\frac{1}{2}x + 6$
-4	
-2	
0	
2	
4	

x	$y = \frac{3}{2}x + 10$
-4	
-2	
0	
1	
2	

Graphically:

3) Use the table of values to graph both equations.



4) What's the point of intersection?

5) Verify that the x-value of the ordered pair is a solution to

$$-\frac{1}{2}x + 6 = \frac{3}{2}x + 10$$

HW: Finish remaining examples of Different ways to Solve a System