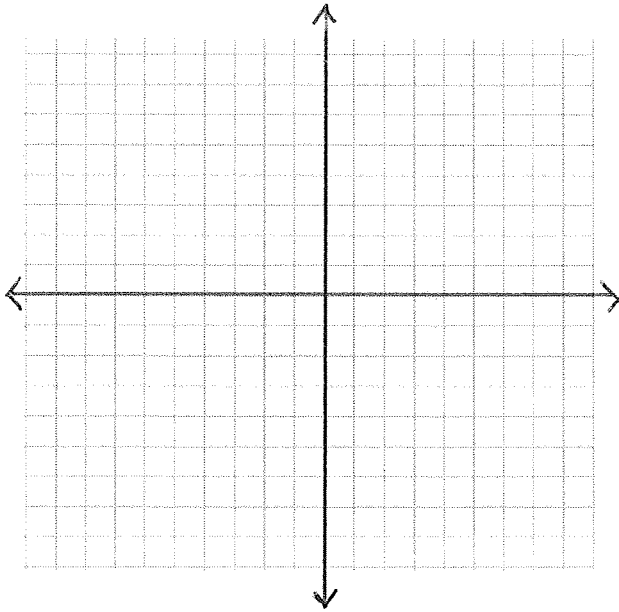


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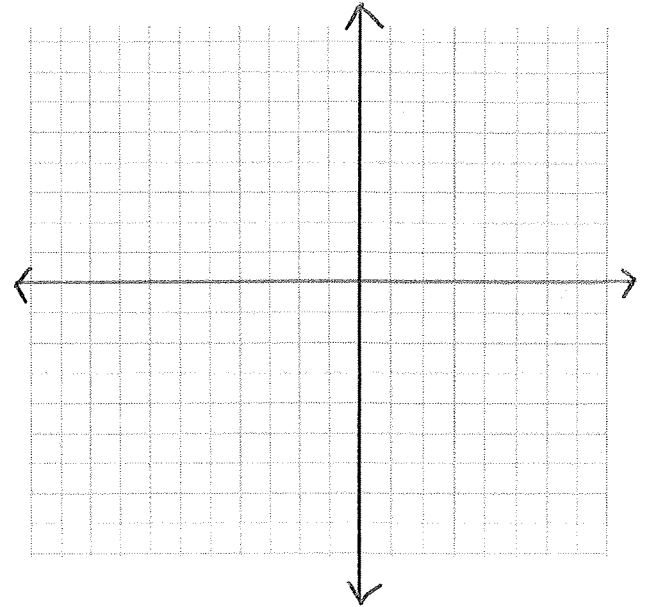
Algebra Ch. 11 Linear Systems

11-1 Warm-Up

1. Graph $y = -3x + 4$



2. Graph $2x + y = 5$



Algebra 11-1 Introduction to Systems

Word	Definition	Example
System of Equations		
Solution of a System		

Finding Solutions by Graphing

1. Graph each equation.

a. Graph by making a _____ OR

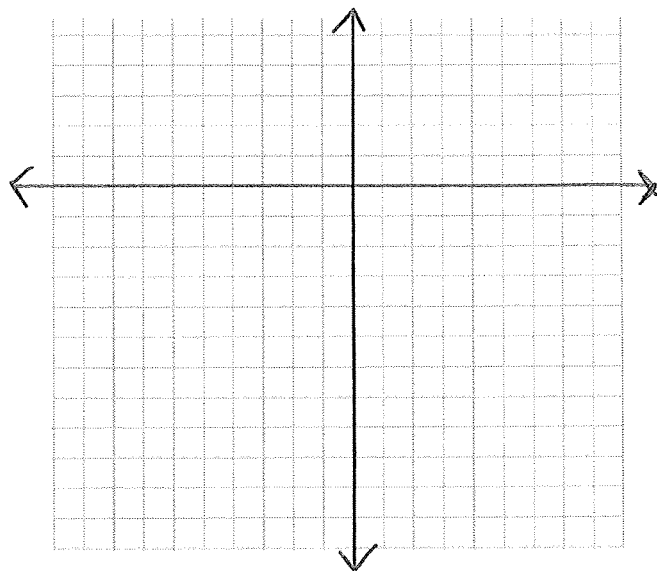
b. Graph by using _____ where $m =$ _____ and $b =$ _____.

2. The point of _____ is the _____.

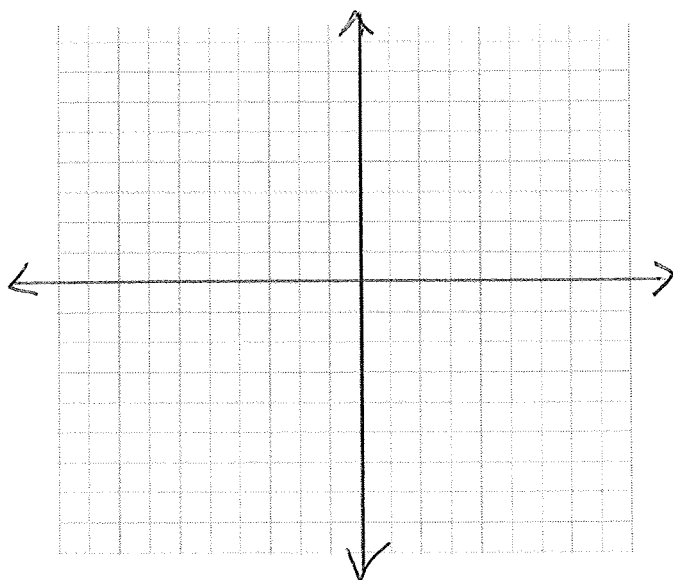
* If the lines do not intersect, then there is _____.

Examples

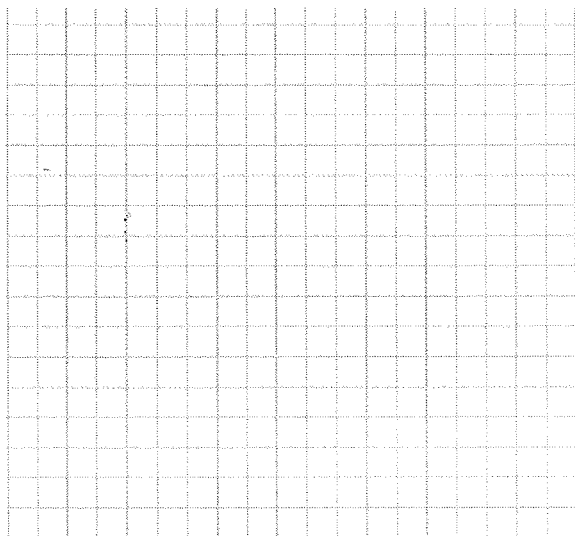
1. Find the solution to the system. $\begin{cases} y = 1.5x - 10 \\ x + y = 0 \end{cases}$



2. Find the solution to the system. $\begin{cases} y = 3x - 1 \\ y = 3x + 2 \end{cases}$



3. Two friends, Joanna and Carey, are growing out their hair. They plan to cut it off at a certain point and donate it to a charity that makes wigs for people with cancer. Joanna's hair is already 20 centimeters long and grows at a constant rate of 1 centimeter per month. Carey's hair is 10 centimeters and growing at a speed of 2 centimeters per month. If the girls get their hair cut on a certain day, they will have exactly the same length to donate. How long will that take?



Assignment: 11-1 #'s 2, 5, 7-13, 16, 17 (4 graphs)

Algebra 11-2: Solving Systems Using Substitution

Warm-Up

1. Solve. $5x - 25 = -8x + 40$

2. $\frac{1}{2}x - 5 = \frac{3}{4}x + 12$

Algebra 11-2: Solving Systems Using Substitution

Solving by Substitution

1. One equation must be solved for a _____. For example, $x + y = 14$ is _____
_____ for a variable but _____ is solved for _____.
2. S_____.
3. Solve the _____.
4. To get the other variable, _____.
5. Check.

Examples

Solve by substitution.

1.
$$\begin{cases} y = 1.5x - 10 \\ x + y = 0 \end{cases}$$

2.
$$\begin{cases} y = 5x + 9 \\ y = -3x + 37 \end{cases}$$

Assignment: 11-2 #'s 1-3, 10-15

Algebra 11-3 More Uses of Substitution

Warm-Up

Solve the system of equations.

1.
$$\begin{cases} y = 3x + 23 \\ y = x + 11 \end{cases}$$

Algebra 11-3 More Uses of Substitution

Examples

1. Where do the equations $y = 6x - 1$ and $7x - 2y = -3$ intersect?

2. A family bought 2 chairs. One chair costs \$15 less than the other. Together they cost \$374. Find the price of each chair.

11-4 Solving Systems by Elimination (Addition)

Warm-Up

Solve the system of equations.

1.
$$\begin{cases} a = 3b - 3 \\ 7a - 2b = 17 \end{cases}$$

Algebra 11-4 Solving Systems by Elimination (Addition)

Goal: To have opposite coefficients in front of the same variable. Then, add the _____ together to _____ a variable.

Solve the system by eliminating a variable.

1.
$$\begin{cases} c + d = 1 \\ c - d = -11 \end{cases}$$

2.
$$\begin{cases} 2x - 5y = 18 \\ 4x - 5y = -4 \end{cases}$$

3. Mark has one less than twice the number of cd's as Felipe has. Together they have 65 cd's. How many cds do each of them have?

Assignment: 11-4 #'s 3-6, 9-15, 17, 22, 23

Algebra 11-5 Solving Systems by Multiplication

Warm-Up

Solve.

1. $2x + 3 = 7$

2. $4x + 6 = 14$

3. What do you notice about the equations you just solved? _____

Algebra 11-5 Solving Systems by Multiplication

Goal: To have opposite coefficients in front of the same variable. Then, add the _____ together to _____ a variable.

Examples

Solve each system of equation.

1.
$$\begin{cases} 5x + 2y = 11 \\ x + 6y = 19 \end{cases}$$

2.
$$\begin{cases} 5a + 3b = -15 \\ a + .5b = -3 \end{cases}$$

Assignment: 11-5 #'s 9-16, 18, 20

Algebra 11-6 Systems & Parallel Lines & 11-7 Situations that Always or Never Happen

Warm-Up

1. Describe parallel lines using words and a drawing.

2. What is true about the slopes of parallel lines (use Ch. 7 notes if you need to)

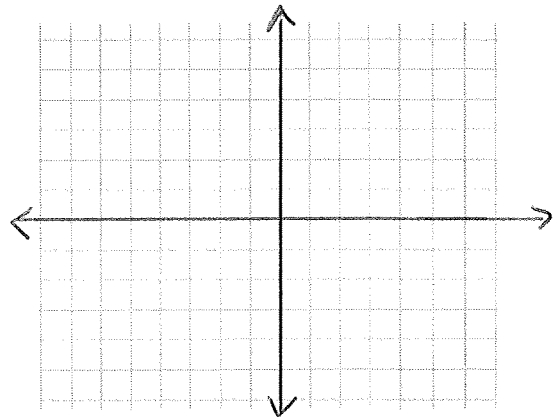
Algebra 11-6 Systems & Parallel Lines

Parallel Lines

Because **parallel lines** do not _____, there is no _____. Remember slopes of parallel lines are _____, and the y-intercepts are _____.

Example

$$\begin{cases} y = -2x + 1 \\ y = -2x - 3 \end{cases}$$

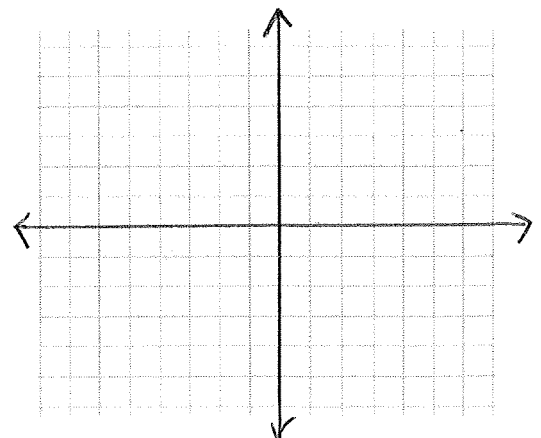


Coincident Lines

Coinciding lines are exactly the same _____ when plotted, but can look _____ when written as an equation. Because a line goes on and on, forever, there are _____ when we plot coinciding lines. Coinciding lines have the same _____ AND the same _____.

Example

$$\begin{cases} y = 1.6x - 6 \\ 16x - 10y = 60 \end{cases}$$



11-7 Situations that Always or Never Happen Assignment

When solving an equation, if you get a _____ statement such as $6 > \underline{\hspace{1cm}}$ or $5 = \underline{\hspace{1cm}}$, then all _____ numbers are the solution.

When solving an equation, if you get a _____ statement such as $6 > \underline{\hspace{1cm}}$ or $5 = \underline{\hspace{1cm}}$, then there is _____ because it is not _____.

Example

1. Solve $9x - 5x - 2(2x+1) = 15$.

2. Solve $20y + 17 - (7 + 20y) < 11$.

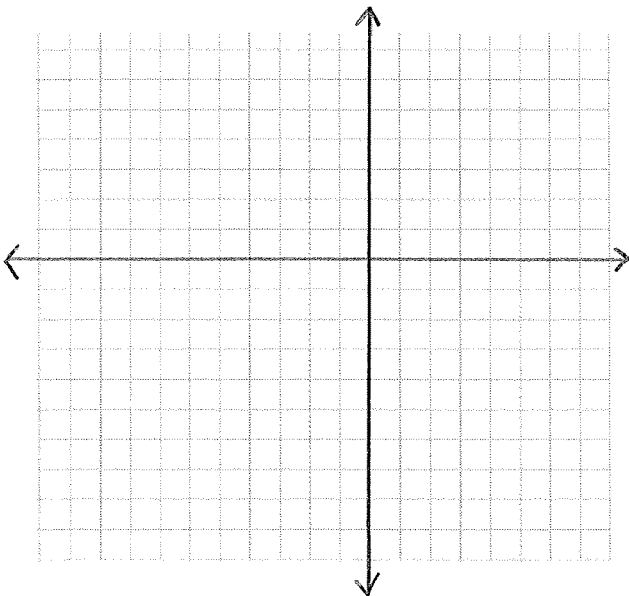
11-6 #'s 1-3, 8-16

11-7#'s 4-9

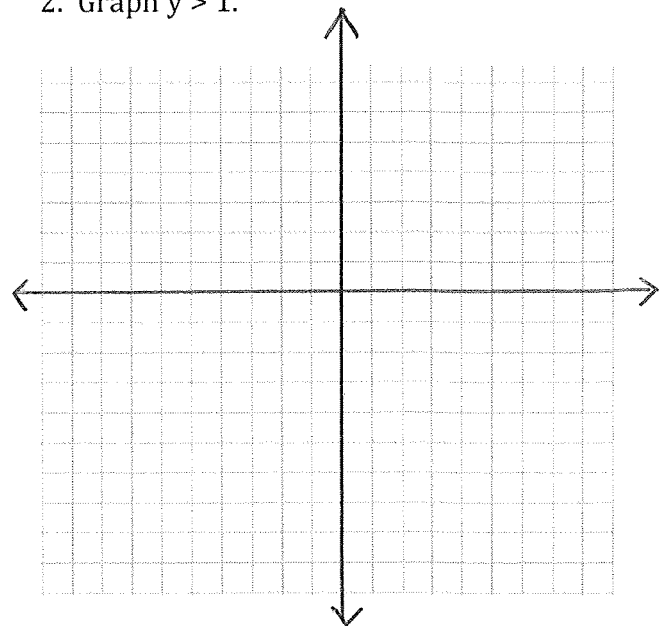
11-8 Systems of Inequalities

Warm Up

1. Graph $y < 3x - 2$.



2. Graph $y > 1$.



11-8 Systems of Inequalities

Steps

1. Graph & shade the first inequality.
 - Graph the line by making a _____ or use the form $y = \underline{\hspace{2cm}}$ where _____ stands for the _____ and _____ stands for the _____.
 - Pick a point (x, y) **clearly** on one side of the line.
 - Test the point to see if it is a _____. Plug _____ and _____ into the inequality.
 - If it is true, then the point **IS** a solution so _____ that side of the line.
 - If it is false, the point **IS NOT** a solution so _____ the **OTHER** side of the line.
2. Graph & shade the second inequality.
3. Darken the overlapping area. (colored pencils help) All points in this area are _____.

Remember...

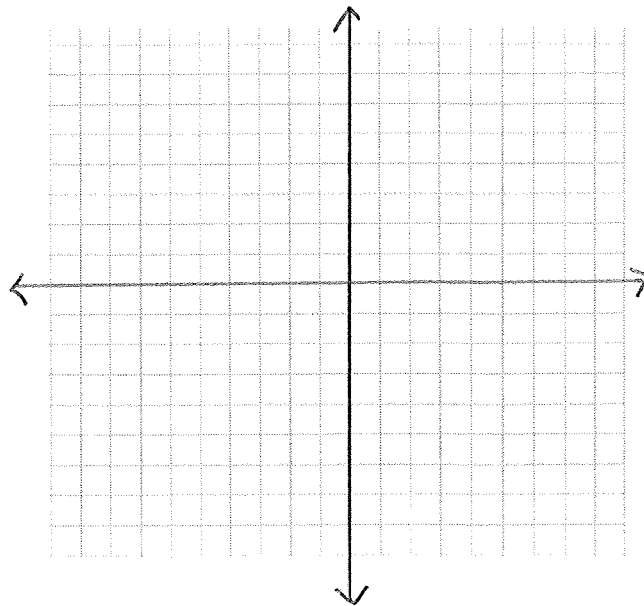
- $<$ or $>$ means use _____ line
- \leq or \geq means use _____ line

Examples

Solve each system of inequalities by graphing.

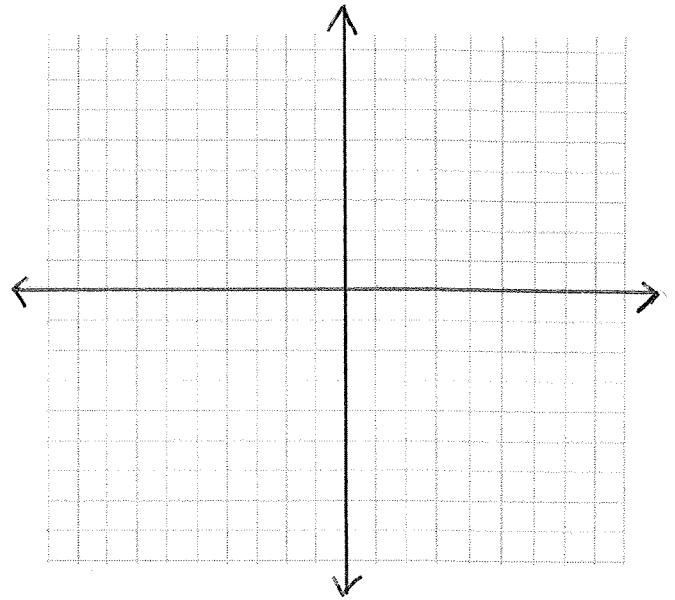
1.

$$\begin{cases} 3x + y \leq 4 \\ x - y > 1 \end{cases}$$



2.

$$\begin{cases} x > 0 \\ y > 1 \\ y < -\frac{1}{2}x + 4 \end{cases}$$



On your own

Suppose 2 positive numbers x and y have a **sum** that is **less than 20** and a **difference** that is **greater than 10**. Graph all possible solutions. (hint: start by writing 4 inequalities)

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