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1) Solve for y:

a. $4y = -4x + 16$

$y = -x + 4$

b. $-4x + 3y = 12$

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

c. $3x - 2y = 6$

$y = \frac{3}{2}x - 3$

2) Given the following equations, graph them on the grid below. Label them!

a. $4x - 4y = 8$

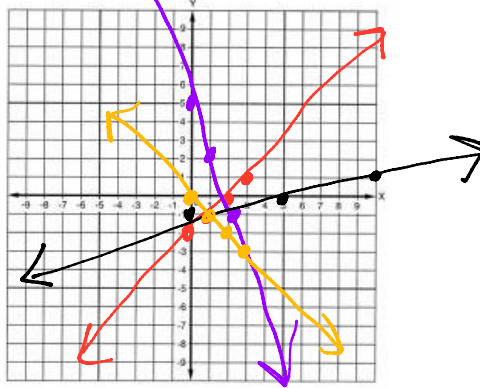
$y = x - 2$

b. $y = -3x + 5$

c. $y = \frac{1}{5}x - 1$

d. $x + y = 0$

$y = -x$



3) Does the point (-3, 10) work for the following systems? Show how you know!

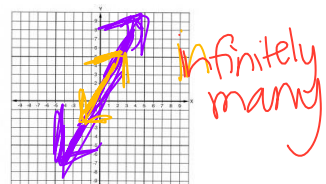
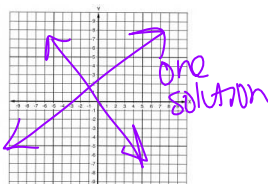
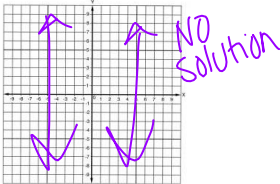
a. $\begin{cases} y > -4x - 2 \\ 4x - y \leq 2 \end{cases}$

$10 > -4(-3) - 2$
 $10 > 12 - 2$
 $10 > 10$ X

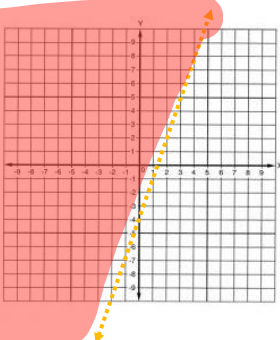
b. $\begin{cases} 3x - 4y < 10 \\ x + 14y \geq -2 \end{cases}$

$3(-3) - 4(10) < 10$
 $-9 - 40 < 10$
 $-49 < 10$ ✓
 $-3 + 14(10) \geq -2$
 $-3 + 140 \geq -2$
 $137 \geq -2$ ✓

4) What are the possible answer options when solving a system of equations? Draw each one below and LABEL!!!



5) Solve the following inequality for y: $9x - 3y < 12$ Graph and shade below. Then pick 3 different points that would work to be in the solution set.



$-8y < -9x + 12$
 $-y < -\frac{9}{8}x + \frac{3}{2}$

$y > 3x - 4$

$(0, 0)$
 $(1, 10)$
 $(-4, 0)$

You can work at most 50 hours next week. You need to earn at least \$150 to cover your weekly expenses. Your dog-walking job pays \$6.50 per hour and your job as a car wash attendant pays \$9 per hour. Write a system of linear inequalities to model the situation. Only set up what they look like. Do not solve!

$x = \text{Dog}$ $y = \text{car}$
 $x + y \leq 50$
 $6.50x + 9y \geq 150$

7) Find the slope for the following lines:

a. $y = \frac{4}{5}x - 1$

b. $6x - 2y = 12$
 $\frac{y}{-2} = \frac{6x+12}{-2} = -3x - 6$
 $y = 3x - 6$

8) What is the difference between the following lines? $>$ vs. \geq and $<$ vs. \leq

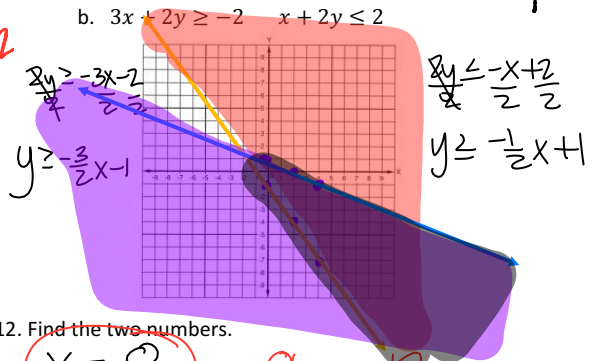
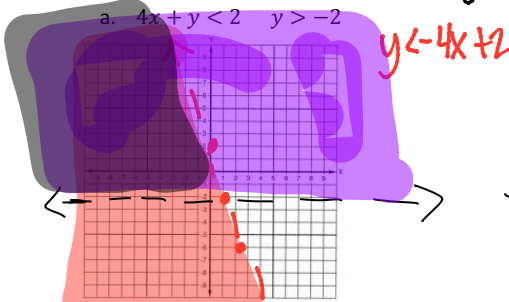
9) Solve the following system by substitution: $\begin{cases} -3x - 3y = 3 \\ y = -5x - 17 \end{cases}$ (-4, 3)

$-3x - 3(-5x - 17) = 3$
 $-3x + 15x + 51 = 3$
 $12x + 51 = 3$
 $12x = -48$
 $x = -4$
 $y = -5(-4) - 17$
 $20 - 17 = 3$
 $y = 3$

10) Solve the following system using elimination. Justify each step as you do it!

System	Justification
$\begin{cases} 9(5x + 4y = -30) \\ 4(3x - 9y = -18) \end{cases}$ $\begin{aligned} 45x + 36y &= -270 & 5(-6) + 4y &= -30 \\ 12x - 36y &= -72 & -30 + 4y &= -30 \end{aligned}$ <hr/> $\begin{aligned} 57x &= -342 & \boxed{-6, 0} & \\ \frac{57x}{57} &= \frac{-342}{57} & 4y &= 0 \\ x &= -6 & y &= 0 \end{aligned}$	<p>① Multiply top by 9 and bottom by 4 to eliminate y</p> <p>② ADD like term</p> <p>③ Divide</p> <p>④ Plug in and solve for y</p> <p>⑤ ADD ⑥ Divide ⑦ Write as point</p>

11) Graph the following system below. Be sure you shade correctly!



12) The difference of two numbers is 4. The sum is 12. Find the two numbers.

$x = 1st \#$
 $y = 2nd \#$

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

$\frac{2x}{2} = \frac{16}{2}$
 $x = 8$

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

- 13) Mike and Molly are selling fruit for a school fundraiser. Customers can buy small boxes of oranges or large boxes of oranges. Mike sold 3 small boxes and 14 large boxes for a total of \$203. Molly sold 11 small boxes and 11 large boxes for \$220. Find the cost of a small box of oranges and a large box of oranges.

$x = \text{small box}$
 $y = \text{large box}$

$$\begin{aligned} 3x + 14y &= 203 \\ 11x + 11y &= 220 \end{aligned}$$

$x = 87$
small box

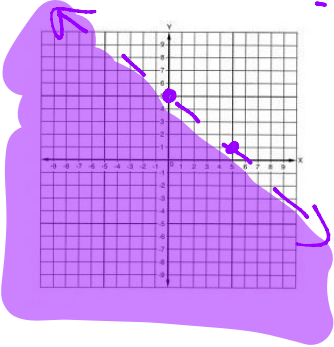
$3x = 21$
 $\frac{21}{3} = 7$

$3x + 14(13) = 203$
 $3x + 182 = 203$
 $3x - 182 = 203 - 182$

$$\begin{aligned} -3x - 154y &= -2233 \\ 3x + 33y &= 660 \\ \hline -121y &= -1573 \\ -121 & \quad -121 \end{aligned}$$

$y = 8/3$
large box

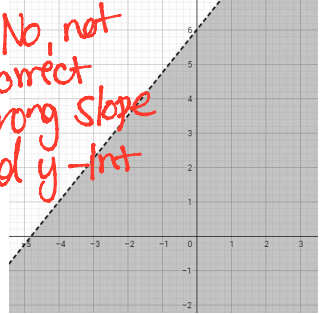
- 14) Graph the following inequality: $4x + 5y < 24$



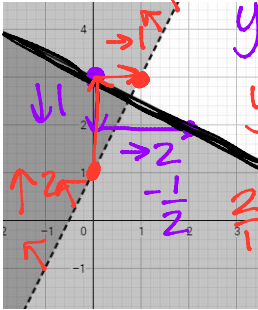
$$\begin{aligned} 5y &< -\frac{4x}{5} + \frac{24}{5} \\ y &< -\frac{4}{5}x + 4.8 \end{aligned}$$

Would the graph look correct if it was shaded like this? Explain!

No, not correct wrong slope and y-int



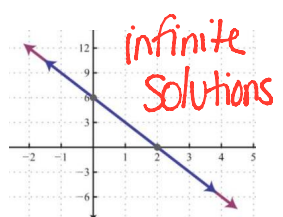
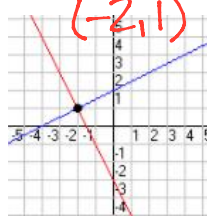
- 15) Create the inequalities for the following graph:



$$\begin{aligned} y &< -\frac{1}{2}x + 3 \\ y &> 2x + 1 \end{aligned}$$

$\frac{2}{1} = 2$

- 16) What are the solutions for the graphs below:



- 17) You can work at least 30 hours next week. You can earn at most \$400 to cover your weekly expenses. You take out the trash for \$5 an hour and your job as a valet parker pays \$6.50 per hour. Write a system of linear inequalities to model the situation. Only set up what they look like. Do not solve!

$x = \text{trash}$
 $y = \text{Valet}$

$$\begin{aligned} x + y &\geq 30 \\ 5x + 6.50y &\leq 400 \end{aligned}$$

- 18) You are trying to do better in math this year. You have scored a 75, 82 and 71 on the last three unit tests. You want to make at least a B in the class. What score do you have to make on the 4th test in order to make at least a B in the class?

$B = 80$

$$\frac{75 + 82 + 71 + x}{4} \geq 80$$

$$4 \cdot \frac{228 + x}{4} \geq 80 \cdot 4$$

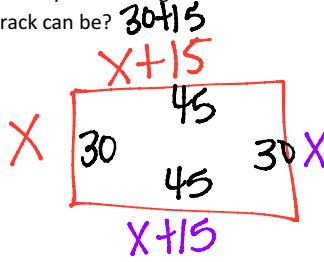
$$228 + x \geq 320$$

$$-228 \quad -228$$

$x \geq 92$

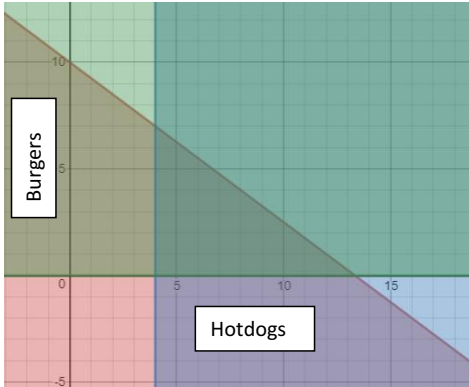
19) You have a plot of land that you want to make into a dirt bike track. You know that the length of the track needs to be 15 feet longer than the width but you cannot go over 150 feet in the perimeter. What are the largest measurements that the dirt bike track can be?

The max could be a 30 x 45 ft track



$$\begin{aligned}
 4x + 30 &\leq 150 \\
 -30 &\quad -30 \\
 \hline
 4x &\leq 120 \\
 \frac{4x}{4} &\leq \frac{120}{4} \\
 x &\leq 30 \text{ ft}
 \end{aligned}$$

20) Mrs. Forrester is throwing you a cookout! Alas...she is cheap and only wants to serve hotdogs and hamburgers. The cost of the hotdogs is \$3 a pack and the hamburgers are \$4 a pack. She wants to buy at least 4 packs of hotdogs. Her maximum budget is \$40. Look at the graph provided below.



Come up with the following:

- A combination of hotdogs and hamburgers that satisfies all the requirements of above.
(5, 5) (many options)
- A combination of hotdogs and hamburgers that only satisfies ONE of the requirements
(15, 5) (many options)