Mod 5 Review Honors

Name_____ Period_____

1. What strategies have we developed to solve systems of equations?

   Substitution
   Elimination
   Graphing

2. What strategies have we developed to solve systems of inequalities?

   * only way is by graphing & shading

3. What does the solution set to a system of an equations look like?

   The Point of intersection between the two lines

4. What does the solution set to a system of inequalities look like?

   The intersection of the two shaded areas

5. How many solutions are there to a system of equations? Give a graphical example of each possibility.

   one

   no solution

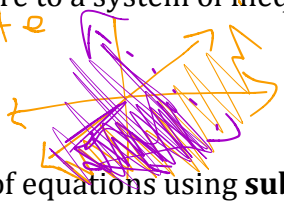
   

   infinite

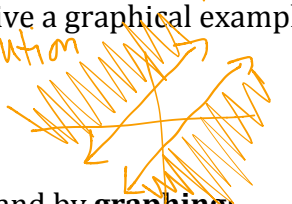
   

6. How many solutions are there to a system of inequalities? Give a graphical example.

   infinite

   No solution

7. Solve the following system of equations using **substitution** and by **graphing**:

   $\begin{cases} y = 16 - x \\ x - y = 9 \end{cases}$

   Show work for substitution below:

   $x - 1(16 - x) = 9$
   $x - 16 + x = 9$
   $2x - 16 = 9$
   $+16 \quad +16$
   $\frac{2x}{2} = \frac{25}{2}$
   $x = 12.5$

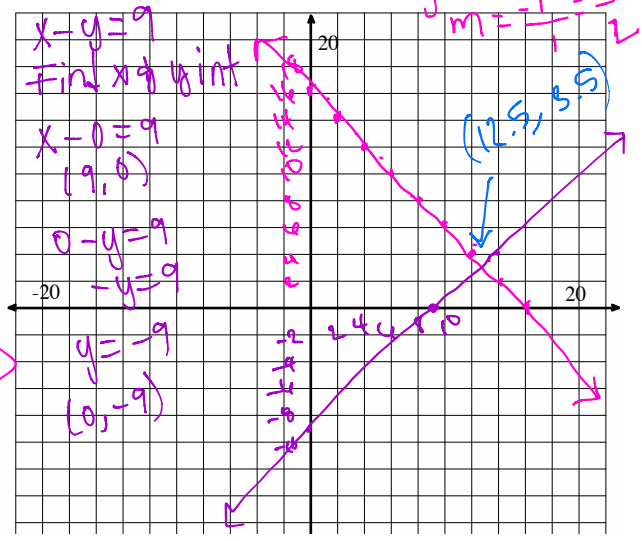
   $y = 16 - x$
   $y = 16 - 12.5$
   $y = 3.5$

   (12.5, 3.5)

   $y = 16 - x$
   $m = \frac{-1}{1} = -1$

   $x - y = 9$
   find x & y int
   $x - 0 = 9$
   (9, 0)
   $0 - y = 9$
   $-y = 9$
   $y = -9$
   (0, -9)

   (12.5, 3.5)

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either change to $y=mx+b$

$3x+5y=7$

$-3x \quad -3x$

$\frac{5y}{5} = \frac{7-3x}{5}$

8. Solve the following system of equations using **elimination** and by **graphing**:

$\begin{cases} 3x+5y=7 \\ 2x-3y=11 \end{cases}$

$3(3x+5y=7) \rightarrow 9x+15y=21$

$5(2x-3y=11) \rightarrow +10x-15y=55$

Show work for elimination below

$\frac{19x}{19} = \frac{76}{19}$

$x=4$

$3x+5y=7$

$3(4)+5y=7$

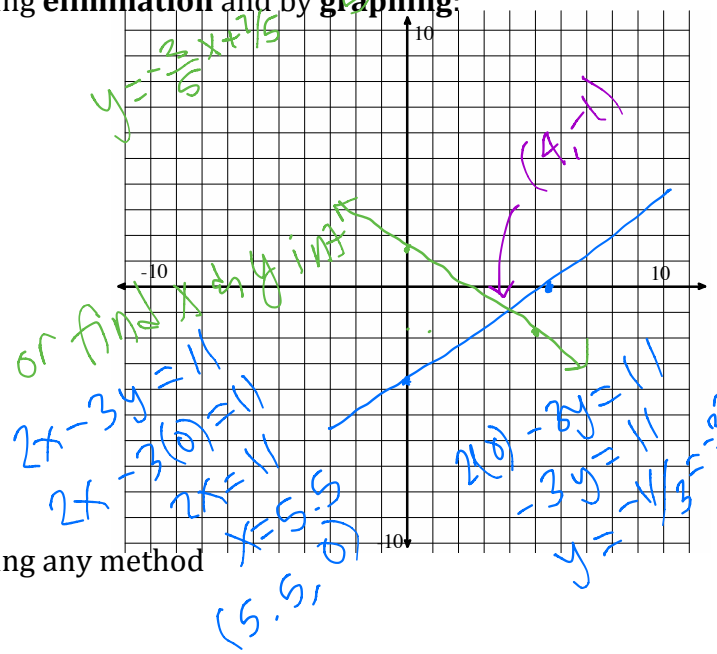
$12+5y=7$

$-12 \quad -12$

$\frac{5y}{5} = \frac{-5}{5}$

$y=-1$

$(4,-1)$



$y=-\frac{3}{5}x+\frac{7}{5}$

or find x and y intercepts

$2x-3y=11$

$2x-3(0)=11$

$2x=11$

$x=5.5$ or $\frac{11}{2}$

$(5.5, 0)$

$2(0)-3y=11$

$-3y=11$

$y=-\frac{11}{3}$ or $-3\frac{2}{3}$

9. Solve the following system of equations using any method

$\begin{cases} 2x+6y=18 \\ 3x+2y=13 \end{cases}$

$3(2x+6y=18) \rightarrow 6x+18y=54$

$2(3x+2y=13) \rightarrow -6x+4y=26$

$0 \quad 14y=28$

$\frac{14y}{14} = \frac{28}{14}$

$y=2$

$3x+2(2)=13$

$3x+4=13$

$-4 \quad -4$

$3x=9$

$x=3$

$(3,2)$

10. Solve the following system of inequalities:

$\begin{cases} y<3x-1 \\ y \geq -2x+4 \end{cases}$

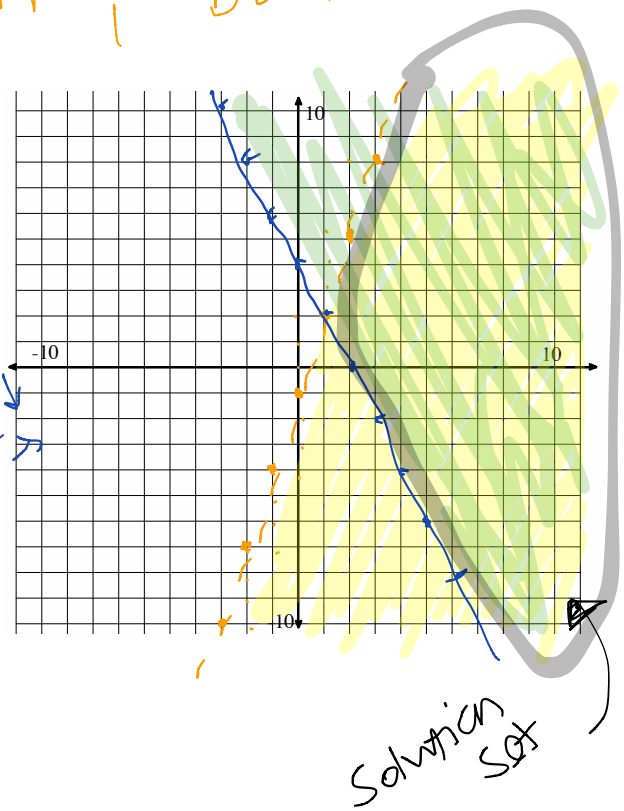
$m=\frac{3}{1} \quad b=-1$

Shading: Check a point

Check $(0,0)$

$0 \stackrel{?}{<} 3(0)-1$

$0 < -1$ False



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

$b=4$

Shading:

Check a point. Try

$(0,0)$

$0 \stackrel{?}{\geq} -2(0)+4$

$0 \geq 4$ False

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Solve each of the systems of equations below using an appropriate method (substitution or elimination)

Substitution

11. $\begin{cases} y = -x + 2 \\ y = 3x - 6 \end{cases}$

$-x+2 = 3x-6$
$+x \quad +x$
$2 = 4x - 6$
$+6 \quad +6$
$\frac{8}{4} = \frac{4x}{4}$
$2 = x$

$y = -x+2$
$= -2+2$
$= 0$
$(2, 0)$

12. $\begin{cases} 3x + 2y = -4 \\ 2x - 2y = -6 \end{cases}$

$5x = -10$
$\frac{5x}{5} = \frac{-10}{5}$
$x = -2$

$3(-2) + 2y = -4$
$-6 + 2y = -4$
$+6 \quad +6$
$2y = 2$
$\frac{2y}{2} = \frac{2}{2}$
$y = 1$
$(-2, 1)$

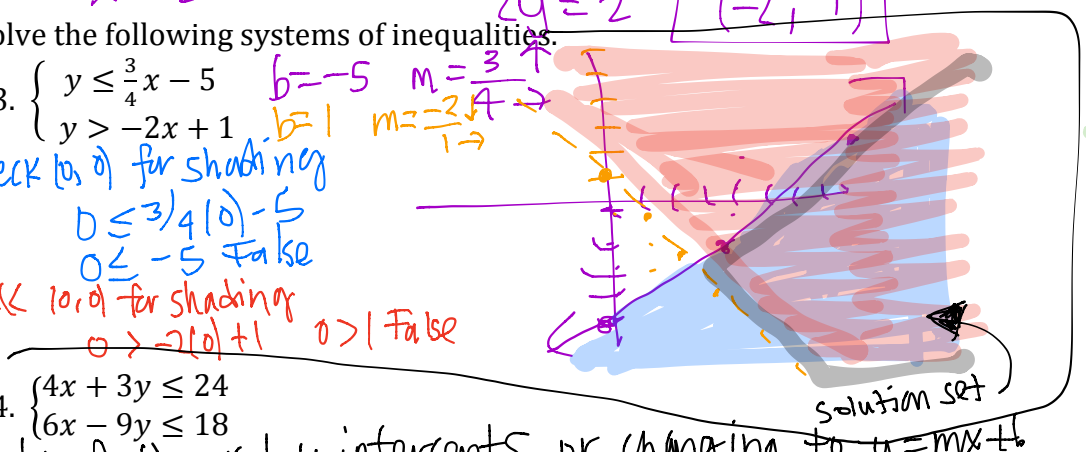
Solve the following systems of inequalities.

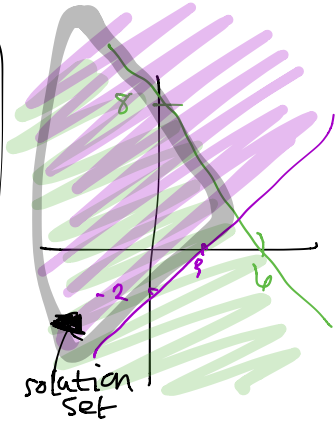
13. $\begin{cases} y \le \frac{3}{4}x - 5 \\ y > -2x + 1 \end{cases}$

$b = -5$, $m = \frac{3}{4}$ ↑ 3, → 4
$b = 1$, $m = \frac{-2}{1}$ ↓ 2, → 1

Check (0,0) for shading
$0 \le \frac{3}{4}(0) - 5$
$0 \le -5$ False

Check (0,0) for shading
$0 > -2(0) + 1$
$0 > 1$ False





14. $\begin{cases} 4x + 3y \le 24 \\ 6x - 9y \le 18 \end{cases}$

Graph by finding x & y intercepts or changing to $y = mx + b$

To find x int of $4x + 3y \le 24$ put in 0 for y
$4x + 3(0) = 24$
$4x = 24 \rightarrow x = 6$
$(6, 0)$

To find y int put $x = 0$ then
$4(0) + 3y = 24$
$y = 8$ $(0, 8)$

Similar for $6x - 9y \le 18$
$6x - 9(0) = 18$
$6x = 18$ $(3, 0)$
$x = 3$

$6(0) - 9y = 18$
$-9y = 18$
$y = -2$

Circle the points that are solutions to the system of inequalities.

15. $\begin{cases} x + y > 4 \\ 2x + 3y \le 12 \end{cases}$

a. (0,4)
b. (4,1)
c. (2,1)

$0 + 4 > 4$ False
$4 + 1 > 4$ TRUE
$2(4) + 3(1) \le 12$
$11 \le 12$ TRUE
$2 + 1 > 4$ False

16. $\begin{cases} y \le \frac{1}{2}x - 3 \\ y \le 4x - 3 \end{cases}$

a. (-2,2)
b. (2,1)
c. (0,-3)

$2 \le \frac{1}{2}(-2) - 3$
$2 \le -4$ False
$1 \le \frac{1}{2}(2) - 3$
$1 \le -2$ False
$-3 \le 4(0) - 3$
$-3 \le -3$ TRUE
$-3 \le \frac{1}{2}(0) - 3$
$-3 \le -3$ TRUE

Circle the points that are solutions to the system of equations.

17. $\begin{cases} y = \frac{1}{2}x - 3 \\ y = 4x - 3 \end{cases}$

a. (0, 3)
b. (10,2)
c. No solution

no solution listed but there is one since slopes are different.

$3 = \frac{1}{2}(0) - 3$
$3 \ne -3$
$2 = \frac{1}{2}(10) - 3$
$2 = 2$ ✓
$2 = 4(10) - 3$
$2 \ne 37$

18. $\begin{cases} y = 3x + 7 \\ y = -3x - 5 \end{cases}$

a. (0,0)
b. (-2,1)
c. (-1, 4)

only one solution

$0 = 3(0) + 7$
$0 \ne 7$
$1 = 3(-2) + 7$
$1 = 1$ ✓
$1 = -3(-2) - 5$
$1 = 1$ ✓

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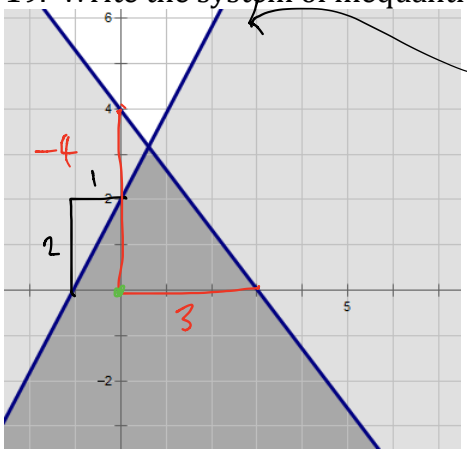
m: -4/3
b ≥ 4
$y \leq -\frac{4}{3}x+4$
$0 \leq -\frac{4}{3}(0)+4$
$0 \leq 4$

19. Write the system of inequalities that matches the following graph



$m = \frac{2}{1}$
$b = 2$ (y int)
$y \leq 2x+2$
↓
Check (0,0)
$0 \leq 2$ True

$\begin{cases} y \leq 2x+7 \\ y \leq -\frac{4}{3}x+4 \end{cases}$

20. When graphing an inequality what does a dotted line mean?

That we don't want to include the points on the line in the solution → its just > or <

Solve the following systems of equations by **using a method other than graphing**. Use whatever method is most efficient for the given system. Write your answer as a coordinate point.

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

substitution
$-3(y-1)+2y=-1$
$-3y+3+2y=-1$
$-y+3=-1$
$-3 \quad -3$
$-y=-4$
$y=4$
since $x=y-1$
then $x=4-1=3$

(3, 4)

22. $\begin{cases} -7x-2y=-13 \\ x-2y=11 \end{cases}$

Elimination
$-8x=-24$
$\frac{-8x}{-8}=\frac{-24}{-8}$
$x=3$

since $x-2y=11$
then $3-2y=11$
$-3 \quad -3$
$-2y=8$
$\frac{-2y}{-2}=\frac{8}{-2}$
$y=-4$

(3, -4)

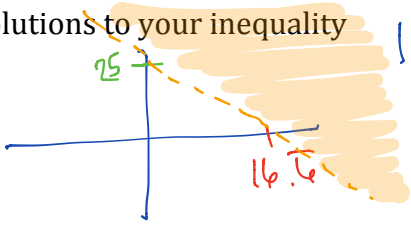
23. You are shopping at Walmart for popsicles. You want to get blue-raspberry and cherry flavors. The blue-raspberry are bigger, so they cost $1.50 each while the cherry are only $1. Walmart is having a special and you get a free gift if you spend over $25. You want to find all of the different combinations of popsicles that you could buy and get a free gift.

(a) Write an inequality for the situation above.

$1.5x+1y > 25$

x = # of Blue-Raspberry
y = # of cherry

(b) Find all of the solutions to your inequality



$1.5x+y>25$

x int
$1.5x > 25$
$x > 16.6$

y int
$y > 25$

check (0,0) for shading
$1.5(0)+0>25$
$0>25$
False

(c) Are all of the solutions that you found in (b) viable?

No - only the positive whole number values in the shaded area make sense.