Practice Test #6
Algebra P3

Name: KEY

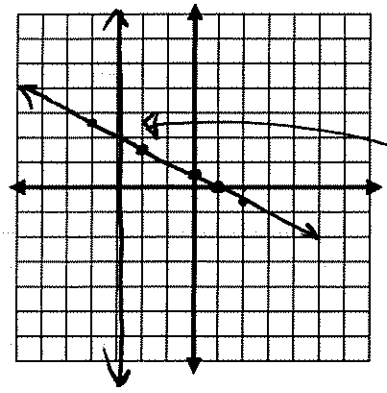
A non-graphing calculator is allowed for this test.

1. Solve by graphing.

$x = -3$

$2y + x = 1$ → $2y = -x + 1$, $y = -\frac{1}{2}x + \frac{1}{2}$

x	y
0	1/2
1	0

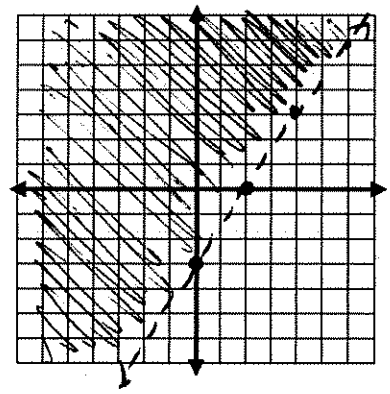


(-3, 2)

2. Graph the solutions to the linear inequality $3x - 2y < 6$.

$-2y < -3x + 6$

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



3. Solve using a system of equations. Any method is okay.

A chemist mixed a 10% salt solution with a 45% salt solution and got 25 liters of a 30% salt solution. How much of each did she mix together originally?

$x + y = 25$ → $y = -x + 25$

$.1x + .45y = .30(25)$

$.1x + .45(-x + 25) = 7.5$

$.1x - .45x + 11.25 = 7.5$

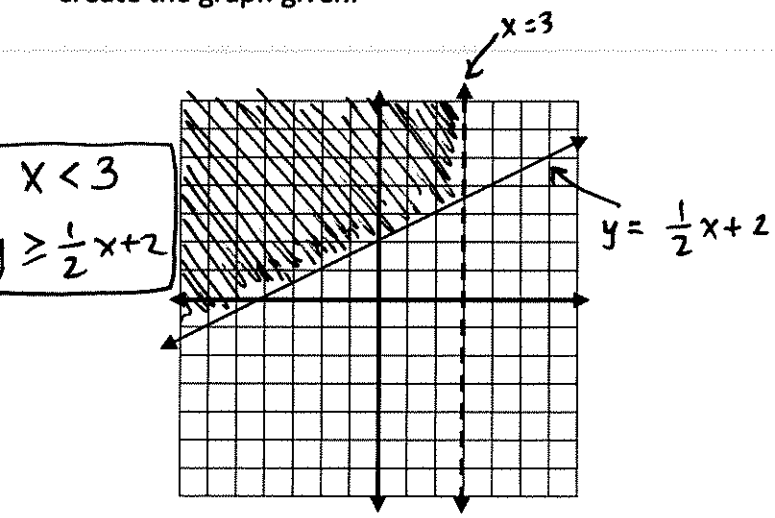
$\frac{-.35x}{-.35} = \frac{-3.75}{-.35}$

$\begin{cases} x = 10.71 \text{ liters} \\ y = 14.29 \text{ liters} \end{cases}$

x = liters 10% solution
y = liters 45% solution

She mixed 10.71 liters of 10% solution with 14.29 liters of 45% solution.

4. Write a system of inequalities that would create the graph given.



5. Give the equation of a line perpendicular to $3x - 2y = 4$ but through the point (-3, -6).

$3x - 2y = 4$

$-2y = -3x + 4$

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

old m: $\frac{3}{2}$

new m: $-\frac{2}{3}$

$y + 6 = -\frac{2}{3}(x + 3)$

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

$y = -\frac{2}{3}x - 8$

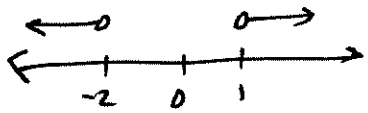
6. Solve for x. If it is an inequality, graph the solution set.

a. $-4x>8$ *OR* $5x-1>4$

$\frac{-4x}{-4} > \frac{8}{-4}$ $\quad$ $\frac{5x-1}{+1\ +1} > \frac{4}{+1\ +1}$

$x<-2$ $\quad$ $\frac{5x}{5} > \frac{5}{5}$

$x<-2$ OR $x>1$



b. $|3x-4|\le 8$

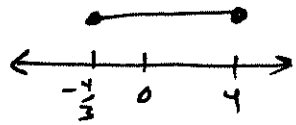
$-8 \le 3x-4 \le 8$

$+4 \quad +4 \quad +4$

$-4 \le 3x \le 12$

$\frac{-4}{3} \quad \frac{3x}{3} \quad \frac{12}{3}$

$-\frac{4}{3} \le x \le 4$



c. $4|x|-2=3$

$+2 \quad +2$

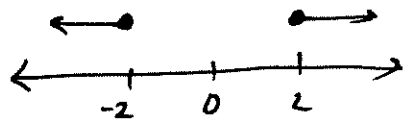
$\frac{4|x|}{4} = \frac{5}{4}$

$|x| = \frac{5}{4}$

$x=\frac{5}{4}$ $\quad$ $x=-\frac{5}{4}$

d. $|x|\ge 2$

$x\le -2$ OR $x\ge 2$



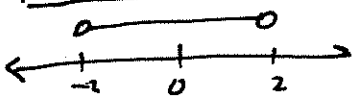
e. $-4<-3x+2\le 8$

$-2 \quad -2 \quad -2$

$\frac{-6}{-3} < \frac{-3x}{-3} \le \frac{6}{-3}$

$2 > x \ge -2$

$-2 < x \le 2$



f. $|3x|+6\le 4$

$|3x| \le -2$

no solution

g. $-3(x-4)+2x>4x+3$

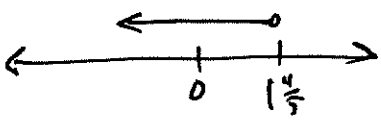
$-3x+12+2x>4x+3$

$-x+12>4x+3$

$-5x+12>3$

$-5x>-9$

$x<\frac{9}{5}$



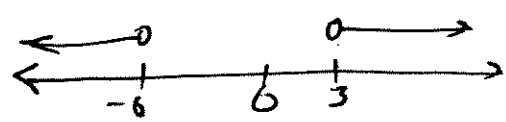
h. $|2x+3|-1>8$

$|2x+3|>9$

$2x+3<-9$ OR $2x+3>9$

$\frac{-3 \quad -3}{2x} < \frac{-12}{2}$ $\quad$ $\frac{-3 \quad -3}{2x} > \frac{6}{2}$

$x<-6$ OR $x>3$



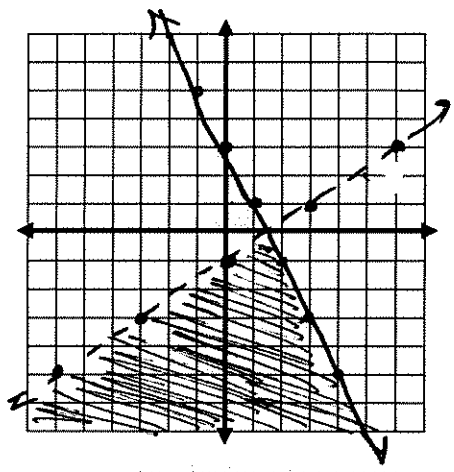
7. a. Graph the system of linear inequalities.

$y \le -2x+3$

$2x-3y>3$

$-3y > -2x+3$

$y < \frac{2}{3}x-1$



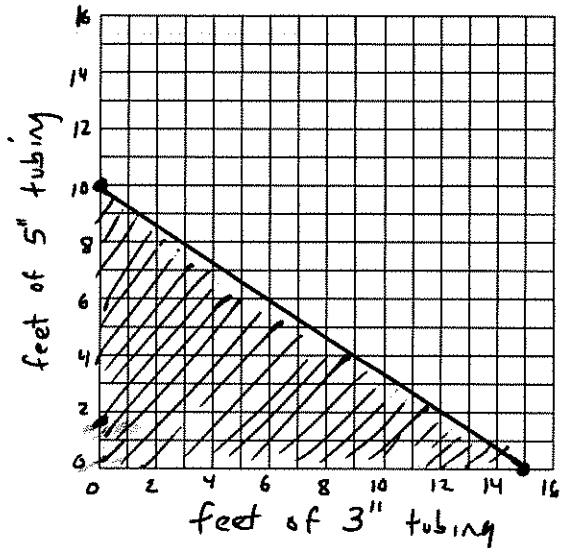
b. Give one point that is a solution to the system above and one point that is not a solution.

solution: $(1,-3)$ not a solution: $(-3,2)$

8. Mallory needs to buy tubing for a plumbing job. The 3" tubing costs \$4 per foot, while the 5" tubing costs \$6 per foot. She can spend up to \$60 for the job she's working on. Write an inequality and graph it. Then give three possible solutions.

x	y
0	10
15	0

x = feet of 3" tubing
y = feet of 5" tubing



Inequality: $4x+6y \le 60$

Three solutions: $(6,1)$ $(4,2)$ $(2,5)$

9. Simplify. Answers should not have negative or zero exponents.

a. $4^{-2} = \frac{1}{4^2} = \frac{1}{16}$

b. $7^0 = 1$

c. $(-3)^{-4}$ $\frac{1}{(-3)^4} = \frac{1}{81}$

d. $3x^{-5} = \frac{3}{x^5}$

e. $\frac{2}{x^{-3}} = \frac{2x^3}{1} = 2x^3$

f. $2^{-1} = \frac{1}{2^1} = \frac{1}{2}$

g. $\frac{x^2}{y^{-7}} = \frac{x^2y^7}{1} = x^2y^7$

h. $a^3b^{-4} = \frac{a^3}{b^4}$

i. $7x^0 = 7(1) = 7$