Algebra 2A Review Chapter 3 Test Fall 2016

1. Solve each system of equations using Substitution or Elimination. You must be able to use each method at least three times. Give solutions as an ordered pair.

a. $2Q - 6R = -88$, $5Q + 7R = 44$

b. $3C - 5D = 17$, $2C - 10D = 38$

c. $6x - 8y = 36$, $15x - 20y = 90$

d. $x + y = 14$, $2x - 6y = 4$

e. $6x + 8y = 60$, $7x + 2y = 26$

f. $18A + 7B = 49$, $27A + 8B = 56$

g. $y = 4x + 13$, $3x + 5y = -188$

h. $8x + 12y = 40$, $10x + 15y = 50$

2. Solve each system of equations. Give answers as ordered pairs.

a. $4a + b - 2c = -30$, $a + 8c = 43$, $7b - c = 8$

b. $12x - 3y + 2z = 57$, $7x + 6y - 5z = 7$, $3x - 10y + 7z = 43$

3. Solve each system of equations by graphing. Give your answer as an ordered pair.

a. $y = -3x + 2$, $y = 2x - 3$

b. $y = -\frac{1}{3}x$, $4x - 12y = -24$

c. $y = -x - 2$, $4x - 2y = 16$

d. $4x + 4y = -28$, $12x - 6y = -48$

4. Graph each system of inequalities. Indicate the solution region with a color and/or by labeling it.

a) $y < -2x + 4$ $4x - 6y \leq 12$ $y \leq 2$

b) $y \geq -2|x + 1| + 3$ $y < \frac{1}{3}x$ $x \leq 3$

5. Model this situation with FIVE inequalities. Define your variables. Joann is going to work two jobs to earn some money to buy a car before the next college semester starts. She needs to earn at least $3500. She can work no more than 480 hours. Her job at the grocery store pays her $12 an hour. Her job at the Veterinary Clinic pays her $15 an hour. She wants to at least twice as many hours at the Vet Clinic than at the grocery store.

6. a. Graph this system of inequalities: $x \geq 0$ $y \geq 2$ $x + y \leq 6$ $6x + 3y \leq 24$

b. Find the coordinates of the vertices of the solution region.

c. Find the coordinate of the point that maximizes the value of P: $P = 5x + 7y$

7. A company makes and sells two kinds of containers: Steel and Aluminum.

>Materials costs are $12 for each steel container and $20 for each aluminum container

>The weekly budget for materials is at most $3600

>Due to the size of their plant they are limited to making up to 240 containers a week

a) Write a system of FOUR inequalities that models these constraints

b) Graph this system of inequalities to find the feasible region.

c) State the coordinates of the corners of the feasible region.

d) Steel containers can be sold for $250 each and Aluminum containers can be sold for $300. Write the Objective Function and find the number of each type of container that should be made each week in order to maximize the company's income.

8. Without actually solving the system of equations state the number of solutions: One, None, or Many

a. $y = 4x - 3$, $12x - 3y = 9$

b. $y = -2x + 5$, $8x - 4y = 24$

c. $y = 3x - 10$, $6x - 2y = 12$

d. $5x + 10y = 20$, $6x - 3y = 24$

9. This morning you bought 6 bolts and 8 nuts for \$1.22. You had to go back and get some more in the afternoon and bought 9 bolts and 5 nuts for \$1.55. Write and solve a system of equations to find the cost of each bolt and each nut.

10. You need to buy some material at the hardware store to remodel your bathroom. You need some pieces of pipe and wood. Pipe cost \$5.75 each and the wood costs \$2.56 each. You walked out carrying 10 items and spent a total of \$35.17. Write and solve a system of equations to find out how many of each you purchased.

11. The cost of a TV is \$24 less than three times the cost of a Camera. If somebody were to buy the 5 TV's and 2 Cameras on the shelf they would have to spend \$2090. Write and solve a system of equations to find the cost of a TV and the cost of a Camera.

12. You need some electrical work done at your house and need to decide between two electricians. One of the electricians will charge you \$80 to come to your house and \$20 an hour to do the work. The other electrician will charge you \$50 to come to your house and \$25 an hour to do the work. Write and solve a system of equations to find the number of hours of work for which the two electricians will have the same total charge.

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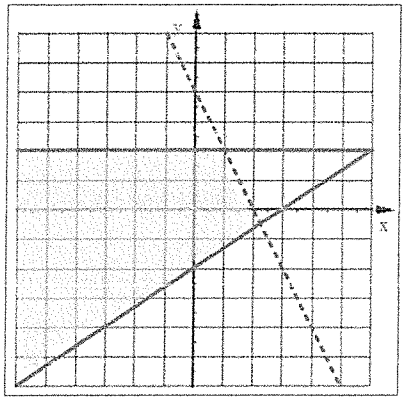
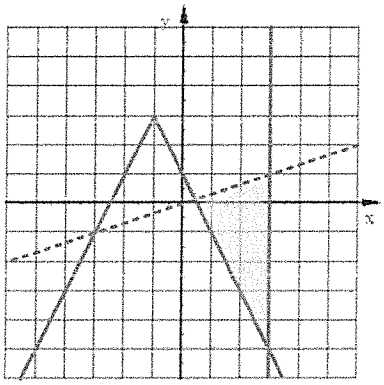
1. a. $(-8,12)$ b. $(-1,-4)$ c. No Solution d. $(11,3)$ e. $(2,6)$ f. $(0,7)$ g. $(-11,-31)$
h. Many Solutions

2. a. $(-5,2,6)$ b) $(4,-1,3)$

3. a. $(1,-1)$ b. $(-3,1)$ c. $(2,-4)$ d. $(-5,-2)$

4. a) b)

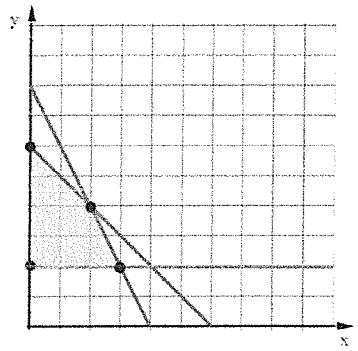




5. G = # hrs worked at grocery store V = # hrs worked at the Vet Clinic

$G \geq 0$ $V \geq 0$ $G+V \leq 480$ $V \geq 2G$ $12G+15V \geq 3500$

6. a. See graph below b. $(0,2),(3,2),(2,4),(0,6)$ c. $(0,6)$ gives a max value of $P = 42$



7. S =# of steel containers A = # aluminum containers

a) $S \geq 0,\ A \geq 0,\ 20A + 12S \leq 3600,\ A + S \leq 240$ b) graph

c) Vertices of solution region: $(A,S) : (0,0),(0,240),(180,0),(90,150)$

d) Objective Function: $Income = 300A + 250S$ Max income when the company makes: 90 Aluminum containers and 150 Steel containers.

8. a. Many b. One c. None d. One

9. B=# bolts N=# nuts

Equations: $6B + 8N = 1.22$ & $9B + 5N = 1.55$

Bolts are \$0.15 each and Nuts are \$0.04 each

10. P=# pieces of pipe W=# pieces of wood

Equations: $P + W = 10$ $5.75P + 2.56W = 35.17$

You bought three pieces of pipe and seven pieces of wood.

11. Equations: $T = 3C - 24$ & $5T + 2C = 2090$

Variables: T = cost of a TV C = cost of a Camers

TV's cost \$366 Cameras cost \$130

12. Variables: T = total charge h = # hours

Equations: $T = 80 + 20h$ & $T = 50 + 25h$

h = 6 hrs