Algebra II- Mrs. Tilus
Unit 3 Part II Review
Test Date: 12/4 (A) and 12/5 (B)
"Prepare well." ELKS

Name _____

1. A roller rink charges a certain fixed amount to rent their facilities, and a separate amount for each guest. A party for 52 people cost $410, and another party for 84 people cost $578. Find the fixed amount to rent the rink, and the amount charged for each guest. **Show your work and label your answer!**

x = fixed cost y = cost per guest

Equation #1 $x + 52y = 410$

Equation #2: $x + 84y = 578$

$\Rightarrow -x - 84y = -578$

$x + 52y = 410$

$-32y = -168$

$\frac{-32y}{-32} = \frac{-168}{-32}$

$y = \$5.25$

$x + 52(5.25) = 410$

$x + 273 = 410$

$-273 \quad -273$

$x = \$137$

The fixed amount to rent the rink is $137, and they charge $5.25 for each guest.

$r \times t = d$

$16 \cdot \frac{3}{4} = 12$

2. Traveling downstream, a boat can cover 16 kilometers in 2 hours. Going upstream, it can make only ¾ of this distance in 2 hours. What is the rate of the boat in still water and what is the rate of the current? **Show your work and label your answer!**

x = speed of boat
y = current speed

Equation #1 $(x + y)2 = 16\text{ Km}$

Equation #2: $(x - y)2 = 12\text{ Km}$

$\div 2 \Rightarrow x + y = 8$

$x - y = 6$

$\frac{2x}{2} = \frac{14}{2}$

$x = 7\text{ Km/hr}$

$7 + y = 8$

$y = 1\text{ Km/hr}$

The rate of the boat in still water is 7 Km/hr, and the rate of the current is 1 Km/hr.

3. Graph the solution set to the system of inequalities. **Shade what is true.**

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

$2x - y < 7$

$-2x \quad -2x$

$y \geq -\frac{2}{3}x + 2$

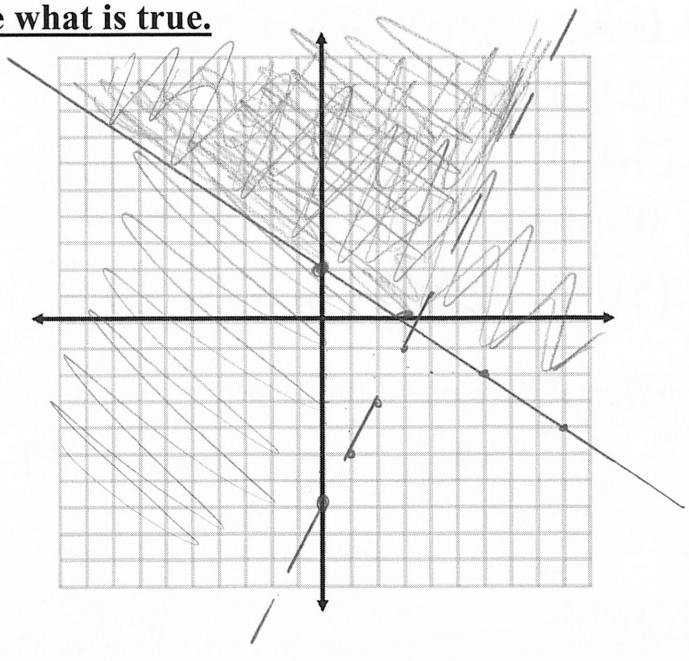
$-y < -2x + 7$

$\frac{-y}{-1} < \frac{-2x}{-1} + \frac{7}{-1}$

Shade Above / Solid line

$y > 2x - 7$

Shade Above
Dashed Line



4. You own a small greenhouse and plan to raise carnations and daisies. Let **x=carnations**, and **y=daisies**. Write an inequality for each of the following restrictions. **Graph each inequality, and shade what is false.**

a) The most you can plant is 46 plants total.

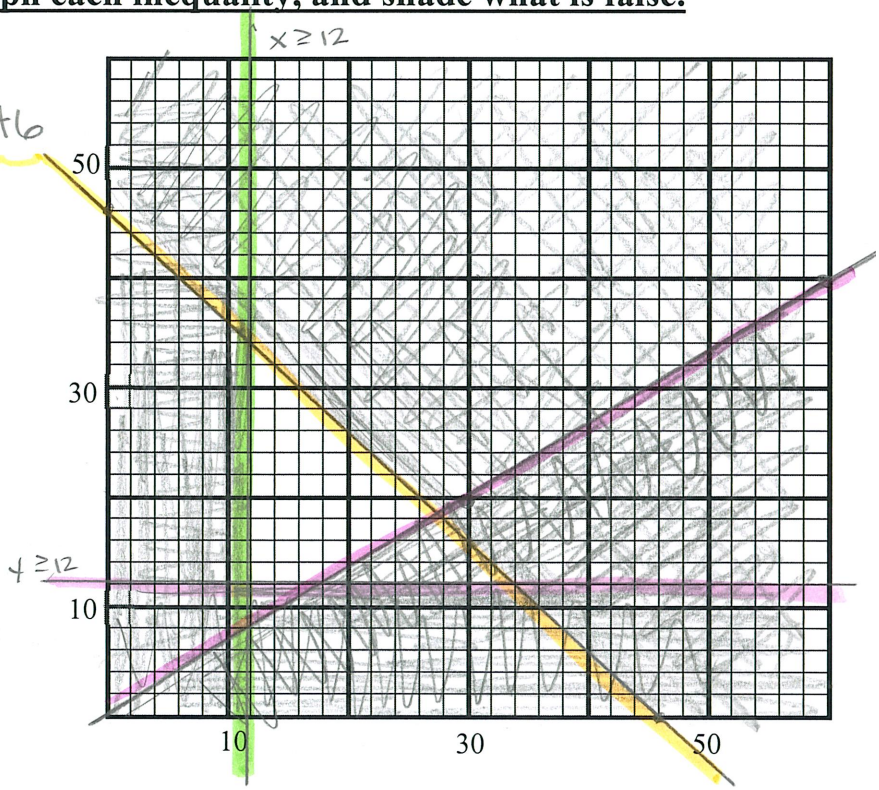
$x + y \leq 46 \rightarrow y \leq -x + 46$

b) You must have at least 12 plants of each kind.
(Hint: You need two inequalities for this part.)

$x \geq 12$ $\quad$ $y \geq 12$

c) The number of daisies must be greater than or equal to 2/3 times the number of carnations.

$y \geq 2/3\,x$



5. The following graph has been completed for a poultry farm. **The number of geese is on the x-axis, and the number of turkeys is on the y-axis.** The feasible region is **shaded**. A goose brings in a profit of $2.00 and a turkey brings in a profit of $3.00.

a) Write the equation representing total profit In terms of geese and turkeys.

Profit = $2x + 3y$

b) Find the coordinates of the point for the maximum profit.

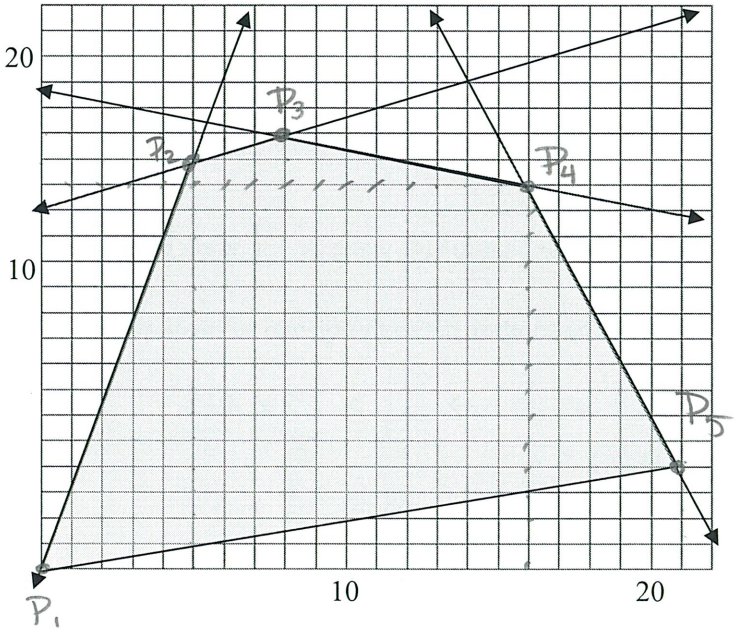
$P_1(0,0) = 2(0) + 3(0) = \$0$

$P_2(5,16) = 2(5) + 3(16) = \$58$

$P_3(8,17) = 2(8) + 3(17) = \$67$

$P_4(16,15) = 2(16) + 3(15) = \$77$

$P_5(21,4) = 2(21) + 3(4) = \$54$



c) What is the profit at this point?

Max Profit = $77 at 16 geese and 15 turkeys.