U3 Day 7 Notes: Graphing Real World Linear Inequalities
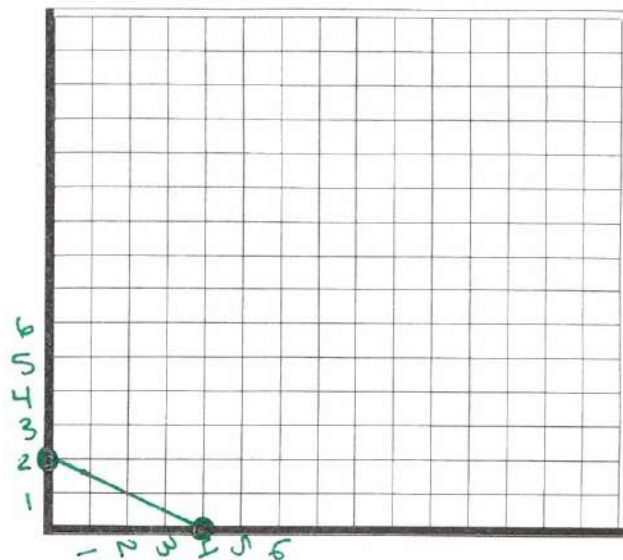
A-REI.12: I can graph the solution of two variable linear inequalities.

$$Ax + By < C, \quad Ax + By \leq C, \quad Ax + By > C, \quad Ax + By \geq C$$

1. Find the x-intercept and y-intercept of $4x + 8y = 16$, and then graph using the intercepts:

$\underline{\text{X-int}}$

$\dfrac{4x}{4} = \dfrac{16}{4}$

$x = 4$

$(4, 0)$

$\underline{\text{Y-int}}$

$\dfrac{8y}{8} = \dfrac{16}{8}$

$y = 2$

$(0, 2)$

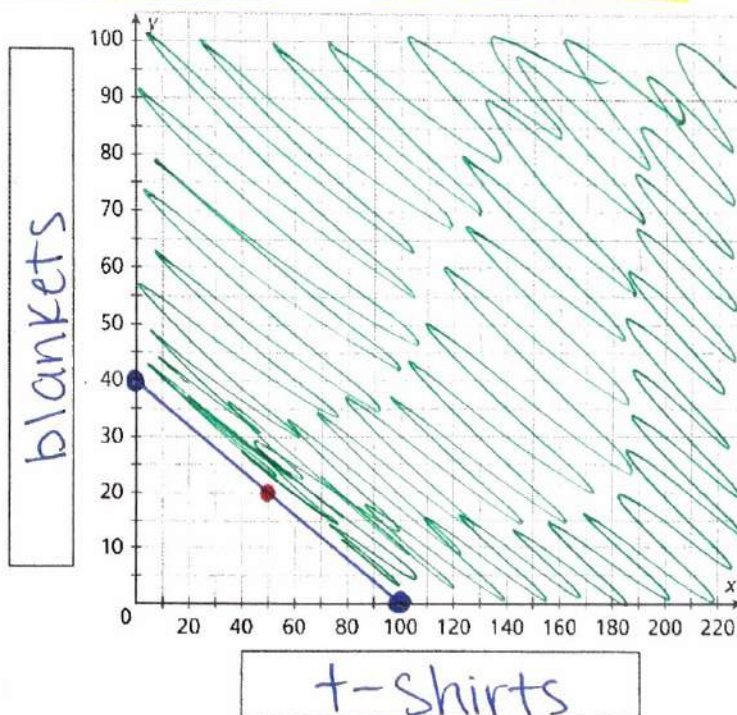**Name 1 solution from the solution set:**

$(2, 1)$, or $(4, 0)$, or $(0, 2)$

2. The Band Booster Club is selling T-shirts and blankets to raise money for a trip. The band director has asked the club to raise at least $1000. The booster club president wants to know how many T-shirts and how many blankets the club needs to sell to exceed their goal of $1000. The T-shirts cost $10 each and the blankets cost $25 each.

$x = $ t-shirts $y = $ blankets

$10x + 25y \geq 1000$

$\underline{\text{X-int}}$

$\dfrac{10x}{10} = \dfrac{1000}{10}$

$x \geq 100$

$(100, 0)$

$\underline{\text{Y-int}}$

$\dfrac{25y}{25} = \dfrac{1000}{25}$

$y \geq 40$

$(0, 40)$

shade above solid line

How many t-shirts and blankets could be sold to generate a profit of at least $1000?

50 t-shirts, 20 blankets

3. You have relatives living in both the United States and Mexico. You are given a prepaid phone card worth $176. The calls within the continental United States cost $.16 per minute and calls to Mexico cost $.44 per minute.

$x = $ calls to U.S. $y = $ calls to Mexico

$$0.16x + 0.44y \leq 176$$

x-int
$$\frac{.16x}{.16} \leq \frac{176}{.16}$$
$$x \leq 1100$$
$$(1100, 0)$$

y-int
$$\frac{.44y}{.44} \leq \frac{176}{.44}$$
$$y \leq 400$$
$$(0, 400)$$
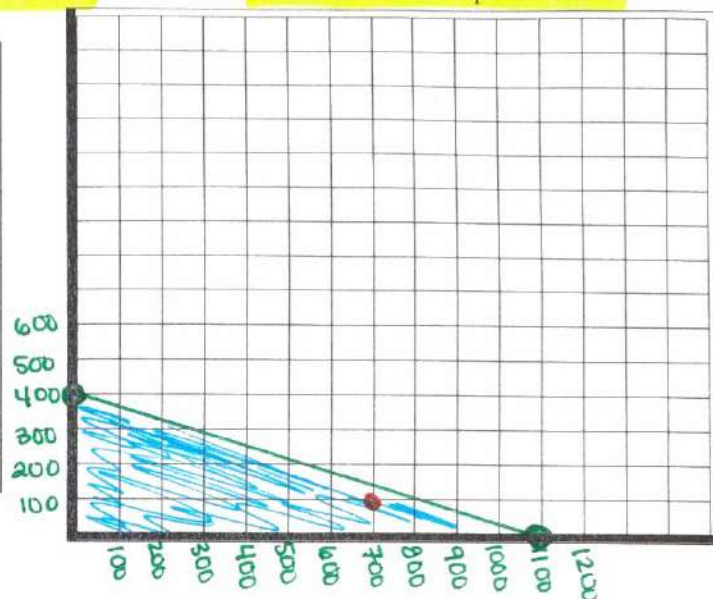
How many minutes could you use to call relatives in both the U.S. and Mexico?

700 min to U.S. and 100 min to Mexico

calls to Mexico

calls to U.S.

4. A music store is selling DVDs and CDs. The store profits $10.00 from each DVD sold and $9.00 from each CD sold. The store needs to make an average profit of at least $450 per hour to stay in business. Using x as the number of DVDs sold and y as the number of CDs sold, write and graph an inequality for the number of each item the store needs to sell to stay in business. If 12 DVDs are sold, how many CDs must be sold?

$x = $ # of DVDs $y = $ # of CDs

$$10x + 9y \geq 450$$

x-int
$$\frac{10x}{10} \geq \frac{450}{10}$$
$$x \geq 45$$
$$(45, 0)$$

y-int
$$\frac{9y}{9} \geq \frac{450}{9}$$
$$y \geq 50$$
$$(0, 50)$$

# of CDs
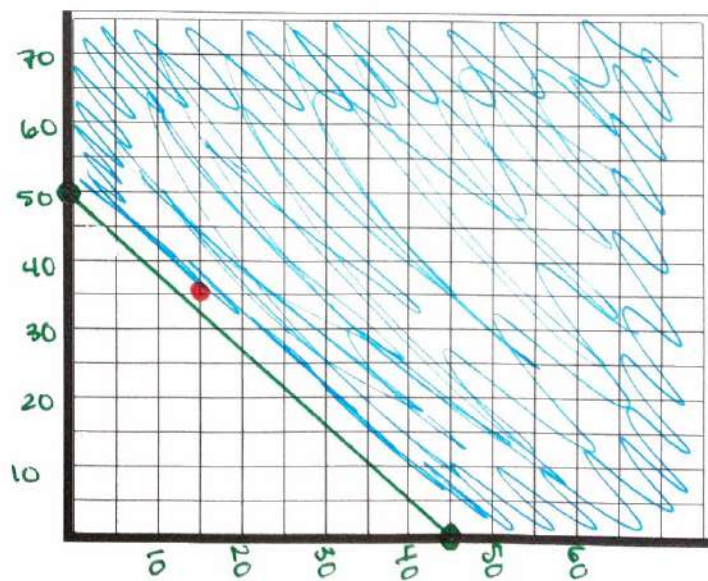
# of DVDs

How many DVDs and CDs could be sold to generate a profit of at least $450?

15 DVDs and 35 CDs

5. Hannah has budgeted $42 every three months for car maintenance. From this she must buy oil costing $3 per gallon and filters that cost $7 each. How much oil and how many filters can Hannah buy within her budget?

x = gallon of oil y = filter

$$3x + 7y \leq 42$$

x-int

$$\frac{\cancel{3}x}{\cancel{3}} \leq \frac{42}{3}$$

$$x \leq 14$$

$$(14, 0)$$

y-int

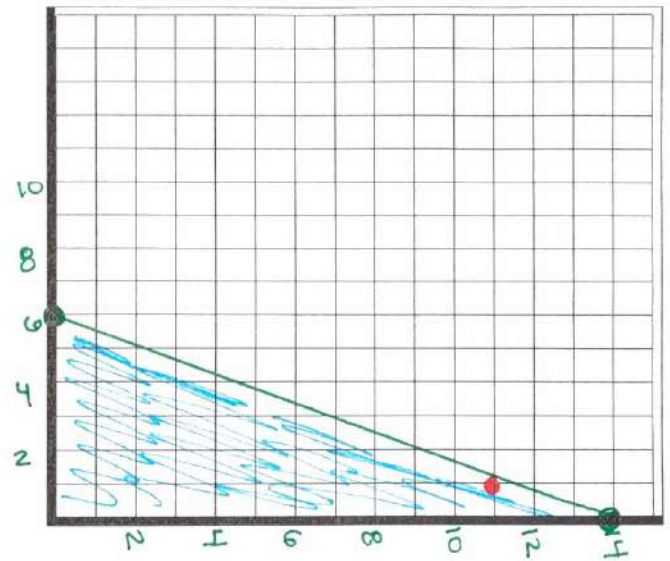$$\frac{\cancel{7}y}{\cancel{7}} \leq \frac{42}{7}$$

$$y \leq 6$$

$$(0, 6)$$

filter

gallon of oil

How many gallons of oil and filters could Hannah buy and still stay within her budget?

11 gallons of oil & 1 filter