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Unit 2 Review

1. You are planning to rent a car for a day while you are in Texas to see your cousin. There are two different rental companies you can choose from. The Express Rental Company charges $40 to rent a car plus 25 cents for every mile you drive. The Cheap Car Rental Company charges $35 to rent a car plus 30 cents per mile to rent the same type of car.

   a. Write your system of equations:

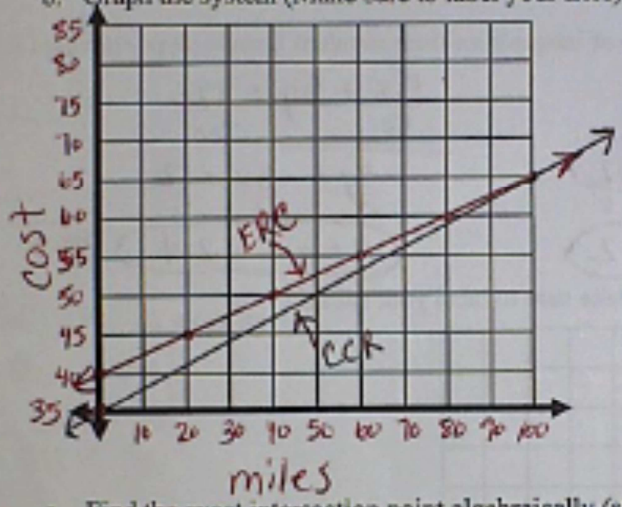
   ERC $y = 0.25x + 40 \rightarrow y = \frac{1}{4}x + 40$

   CCR $y = 0.30x + 35 \rightarrow y = \frac{3}{10}x + 35$

   $\frac{1}{4} = \frac{5}{20}$ ← use equivalent slopes to make graphing easier

   $\frac{3}{10} = \frac{30}{100}$

   b. Graph the system (Make sure to label your axes):



   c. Find the exact intersection point algebraically (**show your work**). Tell what this point means in the context of the problem.

$y = 0.25x + 40$

$y = 0.30x + 35$

I used substitution

$0.25x + 40 = 0.30x + 35$

$-0.25x \quad -0.25x$

$40 = 0.05x + 35$

$-35 \quad -35$

$5 = 0.05x$

$x = 100$

$y = 0.25(100) + 40$

$y = 25 + 40$

$y = 65$

(100, 65)

   d. If you plan on driving 50 miles, which company would give you the better deal? Explain you reasoning.

CCR company, because its cheaper under 100 miles

   e. If you plan on driving 150 miles, which company would give you the better deal? Explain your reasoning.

ERC company, because its cheaper after 100 miles

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2. You are trying to decide what you want to eat for dinner. There are two local sandwich shops that you are thinking about going to. At King Deli, they charge you $4 for a club sandwich and $6 for a supreme sandwich. At Slim's Sandwich Shop, they charge you $5 for either type of sandwich. If you plan on spending no more than $12, how many possible combinations can you purchase at both places. ↖ less than or equal to

a. Write your system of inequalities:

King Deli $4x + 6y \leq 12$

SSS $5x + 5y \leq 12$

b. Change your system of inequalities from standard form to slope-intercept form:

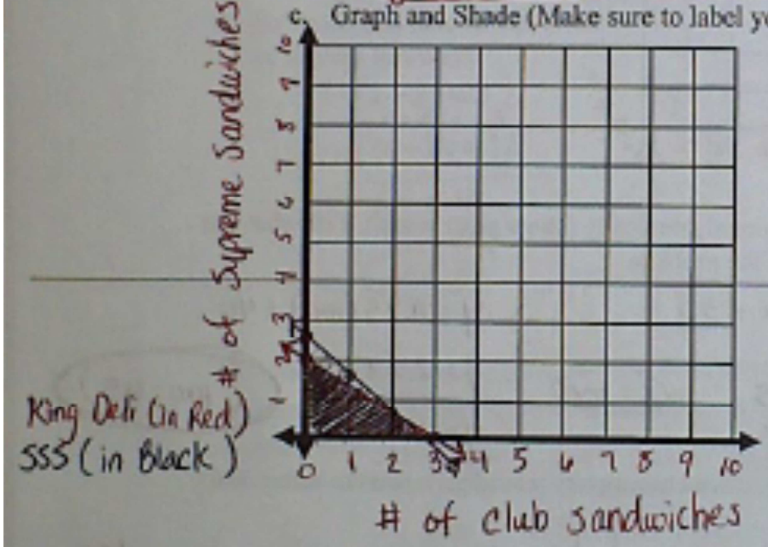
$4x + 6y \leq 12$
$-4x \quad -4x$
$\frac{6y}{6} \leq \frac{-4x}{6} + \frac{12}{6}$

KD $y \leq -\frac{2}{3}x + 2$

$5x + 5y \leq 12$
$-5x \quad -5x$
$\frac{5y}{5} \leq \frac{-5x}{5} + \frac{12}{5}$

$y \leq -x + 2.4$ SSS

c. Graph and Shade (Make sure to label your axes):



King Deli (in Red)
SSS (in Black)

d. Explain what the shaded region means:

In order for you to stay under or equal to $12 you must buy no more than 2 supreme sandwiches or 2.6 club sandwiches. It represents the # of sandwiches you can buy of each, and stay under $12

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3. $\frac{3x}{3} = \frac{21}{3}$, Solve for x

$x = 7$

4. $\frac{x}{4} = 5$, solve for x

$4 \cdot \left(\frac{x}{4} = 5\right) \cdot 4$

$x = 20$

5. $\frac{5y}{5} = \frac{35x}{5} + \frac{40}{5}$, solve for y

$y = 7x + 8$

6. $4(2x - 1) \geq 12$, solve for x

$8x - 4 \geq 12$

$+4 \quad +4$

$\frac{8x}{8} \geq \frac{16}{8}$

$x \geq 2$

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7. $3(3 - 2x) \leq 15$, solve for x

$9 - 6x \leq 15$

$-9 \quad -9$

$\frac{-6x}{-6} \leq \frac{6}{-6}$

Dividing by a negative! →

$x \geq -1$

Sign changes

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8. Your favorite local frozen yogurt place sells its yogurt by weight. The formula they use to determine how much you owe is as follows:

$P(w) = .75w + 2$

P(w) stands for the Price in dollars

w stands for the weight in ounces ω

a. How much would it cost for you to purchase 7 ounces of yogurt?

$P(\omega) = 0.75(7) + 2$

$P(\omega) = 7.25$

P(ω)

b. If you purchased 5 dollars worth of yogurt, how many ounces did you get?

$5 = 0.75\omega + 2$

$-2 \quad -2$

$\frac{3}{0.75} = \frac{0.75\omega}{0.75}$

$4 = \omega$

9. Solve each system of equations by determining the coordinate (intersection), no solution, or infinite solutions:

a. $\begin{cases} x - 2y = 8 \\ 3x - 2y = 12 \end{cases}$ $\quad -1(x - 2y = 8) \rightarrow -x + 2y = -8$

$2x = 4$

$x = 2$

$2 - 2y = 8$

$-2y = 6$

$y = -3$

$(2, -3)$

b. $\begin{cases} x + y = 7 \\ x - y = 1 \end{cases}$ $\quad -1$

$2x = 8$

$x = 4$

$4 + y = 7$

$-4 \quad -4$

$y = 3$

$(4, 3)$

10. Julia and Jackson are raising money for a Mother's Day gift. They have a lemonade stand and are selling cups of lemonade for $2 each and cookies for $1.50 each. They must raise at least $150. greater than or equal to

a. Write an inequality to express the income from the lemonade stand.

$2x + 1.50y \geq 150$

1 dozen = 12

b. They expect to sell at least 3 dozen cookies. Write an inequality to represent this situation.

$2x + 1.50(36) \geq 150$

$2x + 54 \geq 150$

$-54 \quad -54$

$\frac{2x}{2} \geq \frac{96}{2}$

$x \geq 48$

Therefore, they must sell 48 cups of lemonade to reach their $150 goal