Name Key

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#68b

(1) The drama club is running a lemonade stand to raise money for its new production. A local grocery store donated cans of lemonade and bottles of water. Cans of lemonade sell for $2 each and bottles of water sell for $1.50 each. The club needs to raise at least $500 to cover the cost of renting costumes. The students can accept a maximum of 360 cans and bottles.

Write a system of inequalities that can be used to represent this situation.

let
x = # of cans of lemonade sold
y = # of bottles of H_2O sold

I

$2x + 1.50y \geq 500$

$x + y \leq 360$

The club sells 144 cans of lemonade. What is the *least* number of bottles of water that must be sold to cover the cost of renting costumes? Justify your answer.

$500

$2x + 1.50y \geq 500$

$2(144) + 1.50y \geq 500$

$288 + 1.50y \geq 500$

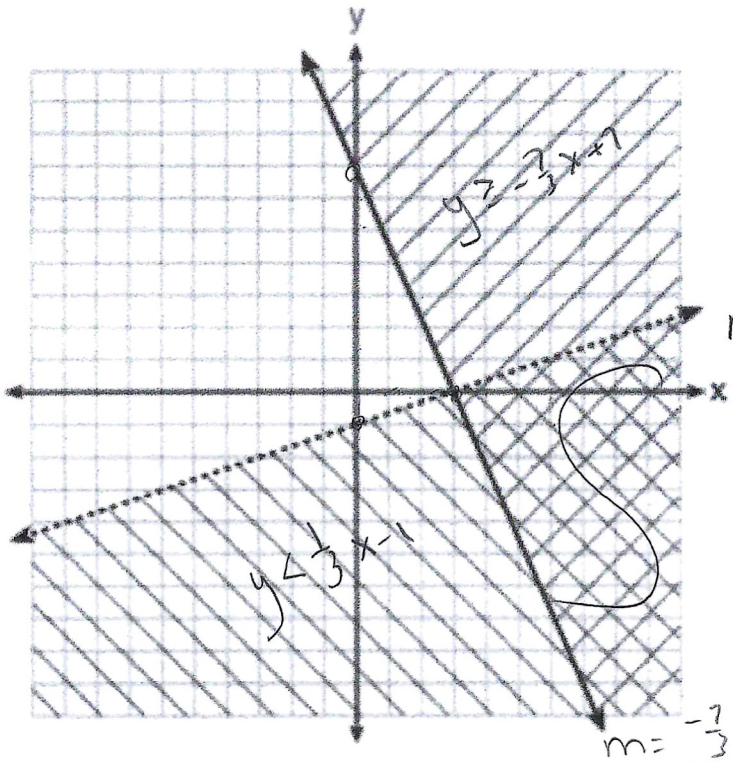
$-288 \quad -288$

$\frac{1.50y}{1.50} \geq \frac{212}{1.50}$

$y \geq 141\frac{1}{3}$

The least # of H_2O bottles that must be sold to raise at least $500 is 142 bottles

(2) Given the graph below:



$m = \frac{1}{3}$
$B = -1$
• dotted
• below
$y < \frac{1}{3}x-1$

$m = -\frac{7}{3}$
$B = 7$
solid
above
$y \geq -\frac{7}{3}x+7$

a) Write the two inequalities represented by the graph above.

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

$y \geq -\frac{7}{3}x+7$

Then, answer the following true for false questions using the graph of inequalities above.

The point $(6, -7)$ is in the solution set: (True) **or** False

on the solid line

If you chose false, explain why:

The point (3,0) is in the solution set: True **or** (False)

If you chose false, explain why:

Even though (3,0) is the POI one of the lines are dotted which means not equal to, therefore that point would not satisfy both inequalities which means it is not a solution point

(3) Two families went to Rollercoaster World. The Brown family paid $170 for 3 children and 2 adults. The Peckham family paid $360 for 4 children and 6 adults. If x is the price of a child's ticket in dollars and y is the price of an adult's ticket in dollars, write a system of equations that models this situation. Graph your system of equations on the set of axes below

legend →

$3x+2y=170$
$4x+6y=360$

$3x+2y=170$
$-3x \quad -3x$

$\frac{2y}{2} = \frac{-3}{2}x + \frac{170}{2}$

$y = -\frac{3}{2}x + 85$

$m = -\frac{3}{2}$ ↓ ↑ →

$B = 85$

$4x+6y=360$
$-4x \quad -4x$

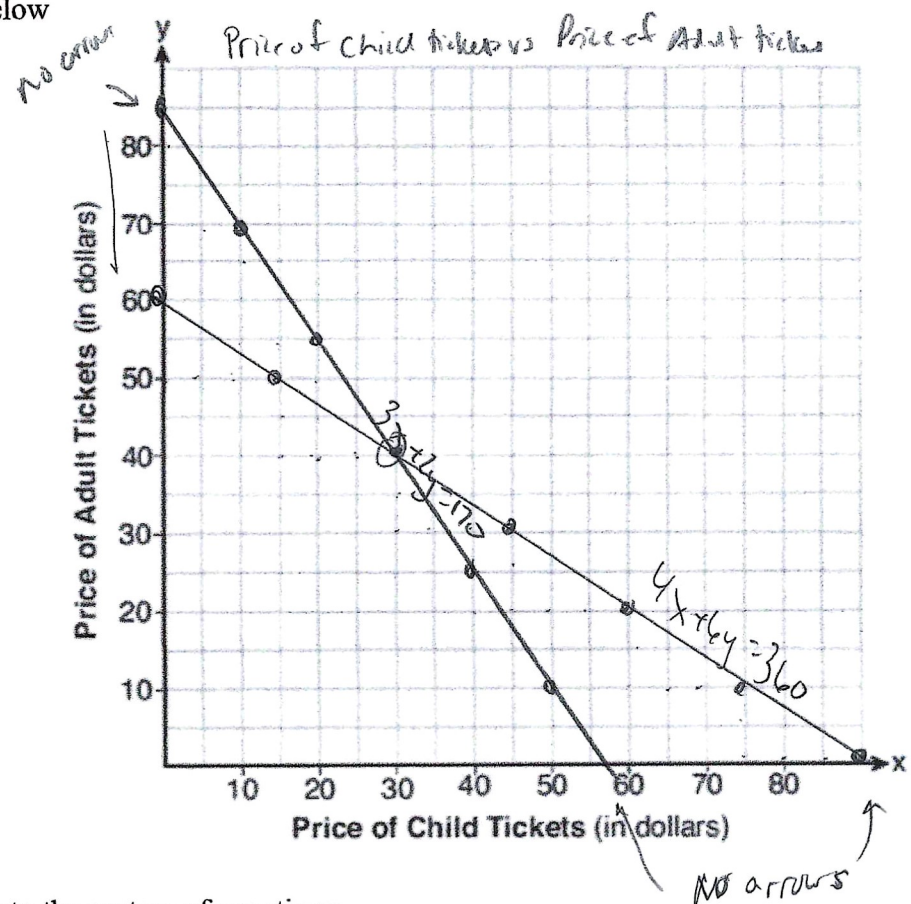
$\frac{6y}{6} = \frac{-4}{6}x + \frac{360}{6}$

$y = -\frac{2}{3}x + 60$

$m = -\frac{2}{3}$ ↓ ↑ →

$B = 60$

* No shading b/c they are equations



a. Show if the point (40, 25) is the solution to the system of equations.

x y

$3x+2y=170$
$3(40)+2(25)=170$
$120+50=170$
$170=170$ ✓

$4x+6y=360$
$4(40)+6(25)=360$
$160+150=360$
$310 \neq 360$

No, (40,25) is not a solution b/c it does not satisfy both equations and it isn't the POI

b. State the solution and explain your reasoning.

(30, 40) is the solution b/c it is where the two lines intersect meaning (30,40) will satisfy both equations

c. Explain what each coordinate of the point of intersection means in the context of the problem.

(30,40) means the price of each children's ticket was $30 + the price of each adult ticket was $40

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(4) Tommy needs to earn at least $120 per week working as both a manager at a grocery store and teaching basketball lessons. He earns $10 per hour at the store and $15 per hour teaching basketball lessons. He can work no more than 20 hours per week due to his busy schedule. Let g represents the hours working at the grocery store and b represents the hours teaching basketball lessons.

↳ This is your legend!

Write a system of linear inequalities to model the situation.

$$10x + 15y \geq 120$$
$$x + y \leq 20$$

Key
$g = x$
$b = y$

Then graph the system on the provided grid.

$10x + 15y \geq 120$
$-10x \quad -10x$

$\frac{15y}{15} \geq \frac{-10x}{15} + \frac{120}{15}$

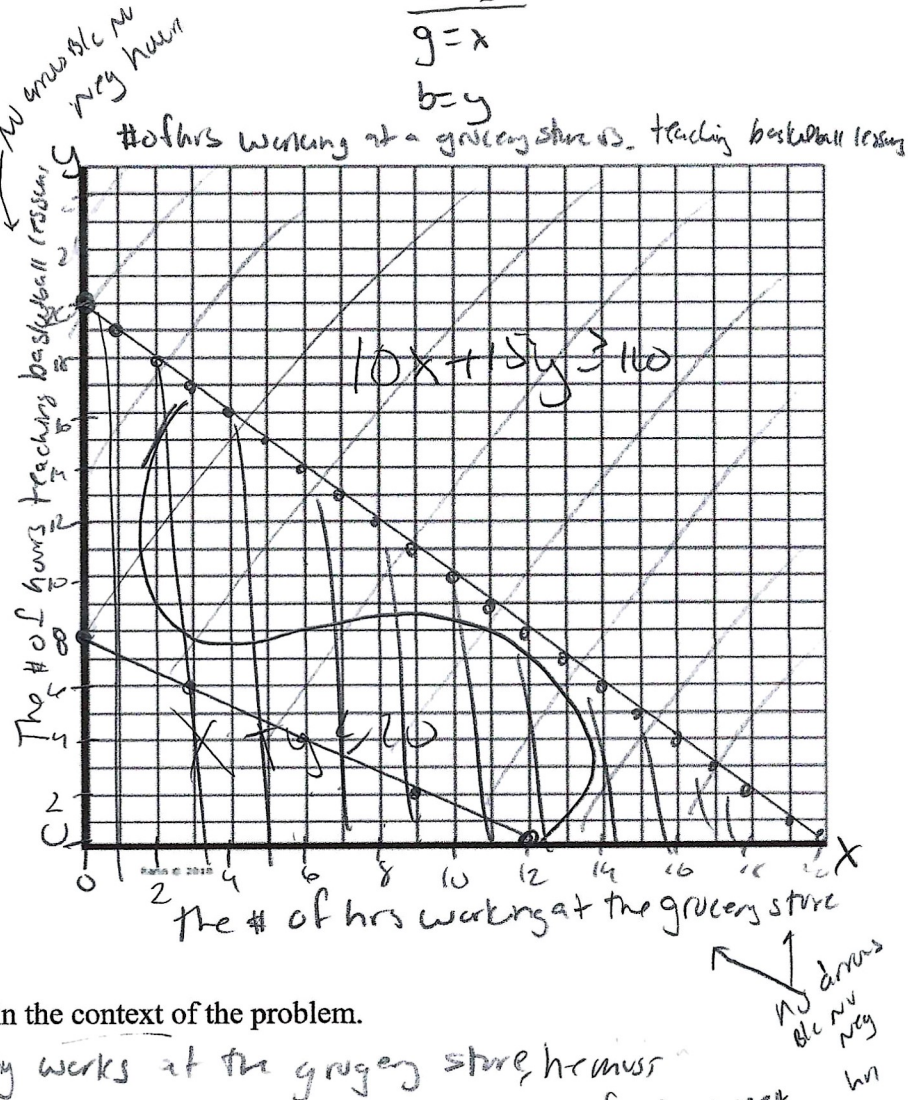
$y \geq -\frac{2}{3}x + 8$

$m = -\frac{2}{3}$
$B = 8$
- solid
- shade above

$x + y \leq 20$
$-x \quad -x$

$y \leq -x + 20$

$m = -1$
$B = 20$
- solid
- shade below



Identify and interpret a solution of the system, in the context of the problem.

(6, 10) For every 6 hours Tommy works at the grocery store, he must teach basketball lessons for 10 hours to earn at least $120 for the week

Use your graph of inequalities to determine whether you can work 8 hours at the grocery store and teach 1 hour of basketball lessons.

No Tommy can not work 8 hours at the grocery store and teach 1 hour of basketball lessons. It is not in the solution set (where the shadings intersect) therefore Tommy would not earn at least $120

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5. It's opening night for Fantastic Flicks Theater. The theater can hold a maximum of 180 people. Adult tickets cost $12.75, and child tickets cost $8.50. The theater's goal is to sell at least $1870 worth of tickets. Write a system of linear inequalities that can be used to find the possible combinations of adult tickets, x, and child tickets, y, that would satisfy the theater's goal. ← The legend

Graph the solution to this system of inequalities on the set of axes below. Label the solution with an S.

$12.75x + 8.50y \geq 1870$

$x + y \leq 180$

$12.75x + 8.50y \geq 1870$

$-12.75x \quad -12.75x$

$\frac{8.50y}{8.5} \geq \frac{-12.75x}{8.5} + \frac{1870}{8.5}$

$y \geq -\frac{3}{2}x + 220$

$m = -\frac{3}{2}$

$B = 220$

• solid

• shade above

$x + y \leq 180$

$-x \quad -x$

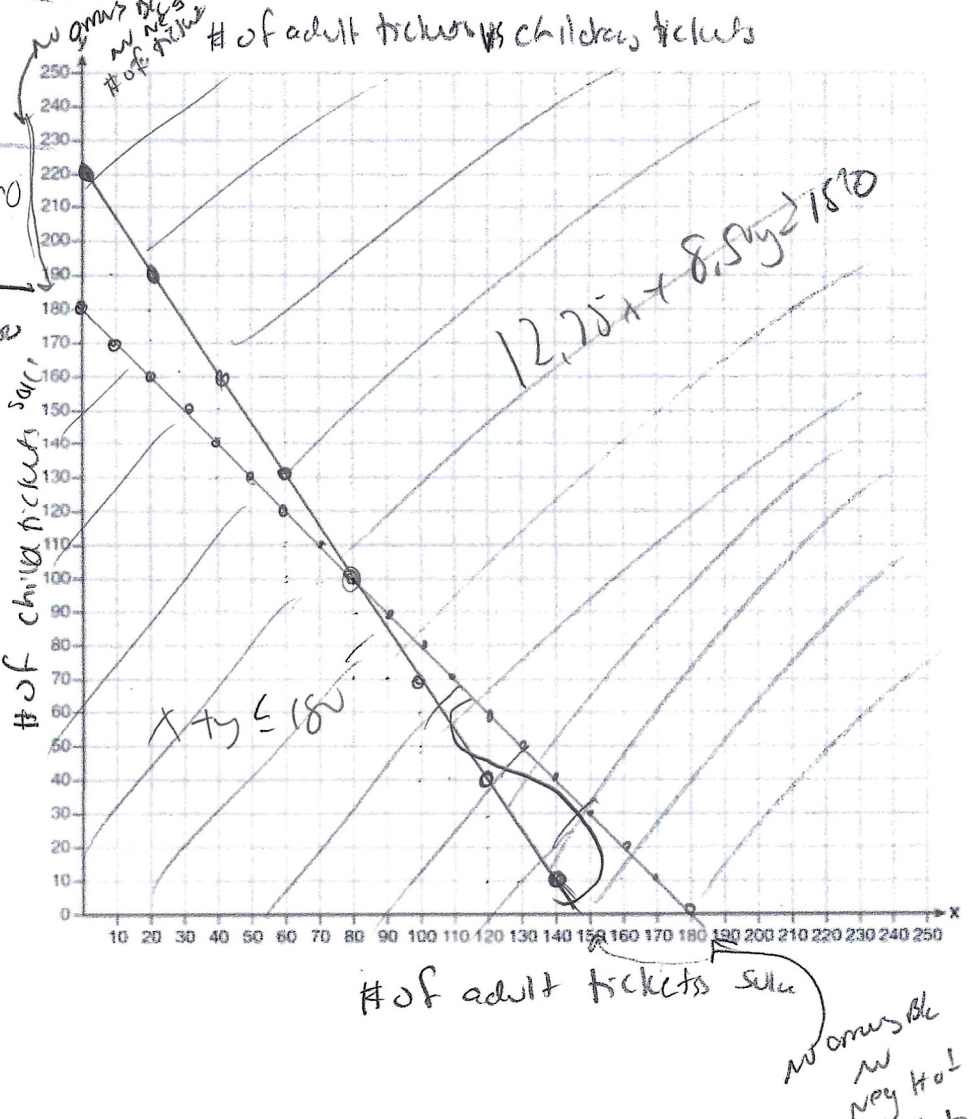
$y \leq -x + 180$

$m = -1$

$B = 180$

• solid

• shade below



Identify and interpret a solution of the system, in the context of the problem.

(160, 10) For every 160 adult tickets sold the theater must sell 10 childrens tickets to reach their goal of $1870

Use your graph of inequalities to determine whether the theater can sell 100 adult tickets and 50 children tickets in order to reach their goal.

No they can not sell 100 adult tickets, 150 childrens tickets Bc it is not in the solution set of where the shadings intersect so they would not reach their goal of $1870