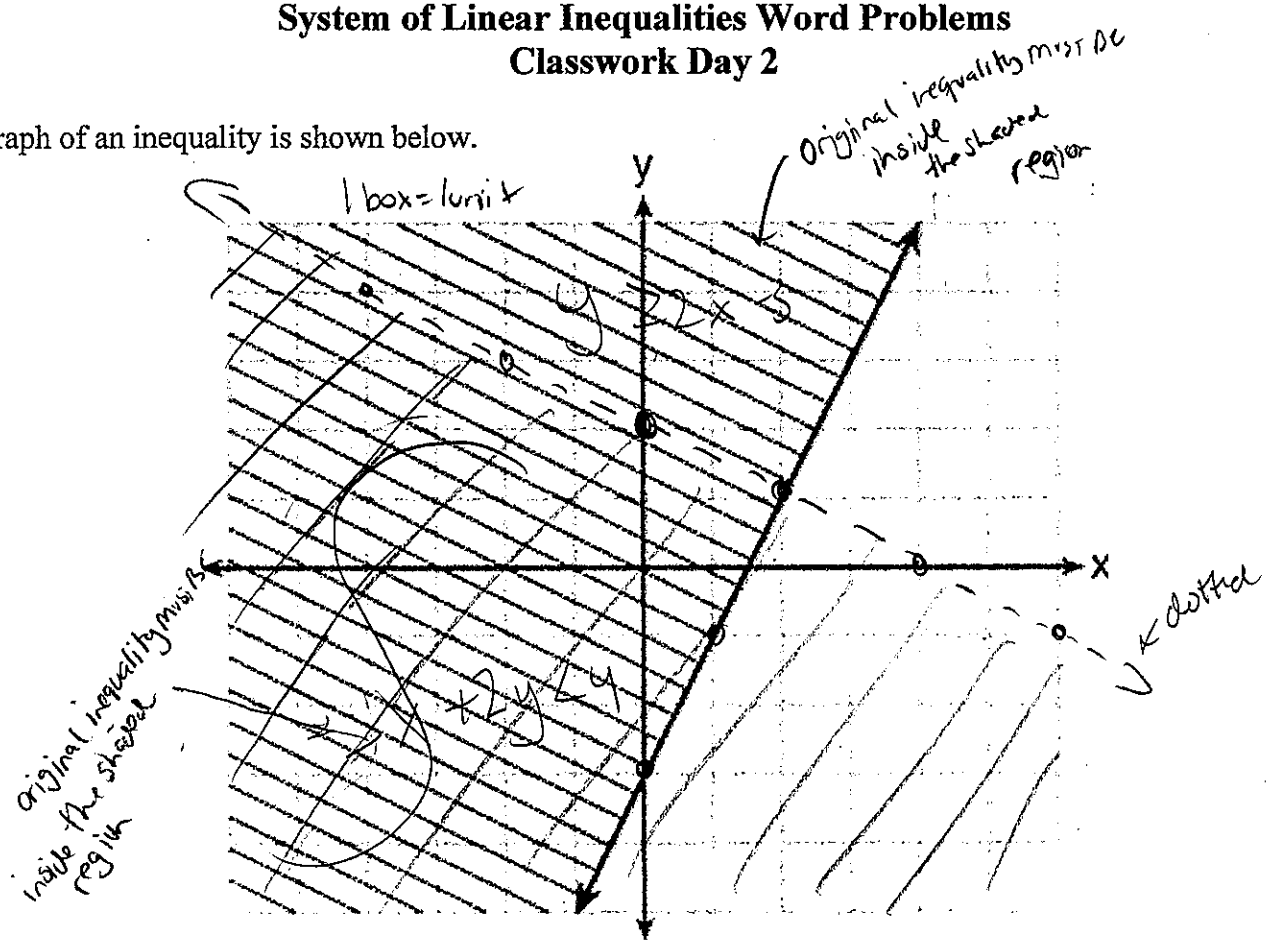
#67b

Name Key Date

Math 8A

System of Linear Inequalities Word Problems
Classwork Day 2

① The graph of an inequality is shown below.



a) Write the inequality represented by the graph.

$m = \frac{2}{1}$

$B = -3$

solid

shade above

$y \geq 2x - 3$

b) On the same set of axes, graph the inequality $x + 2y < 4$.

$-x \quad -x$

$\frac{2y}{2} < \frac{-x}{2} + \frac{4}{2}$

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

$m = -\frac{1}{2}$ ↓ →

$B = 2$

dotted

shade below

c) The two inequalities graphed on the same set of axes form a system. Oscar thinks the point (2,1) is in the solution set for this system of inequalities. Determine and state whether you agree or disagree with Oscar. Explain your reasoning.

I disagree with Oscar. (2,1) is not in the solution set. Even though (2,1) is the point of intersection of the two lines, one of the lines is dotted which means it is NOT equal to, therefore that point would not satisfy both inequalities which means it is not a solution point.

(2) The Reel Good Cinema is conducting a mathematical study. In its theater, there are 200 seats. Adult tickets cost $12.50 and child tickets cost $6.25. The cinema's goal is to sell at least $1500 worth of tickets for the theater.

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 cinema's goal.

$x + y \leq 200$

$12.50x + 6.25y \geq 1500$

$x + y \leq 200$

$-x \quad -x$

$y \leq -x + 200$

really $\frac{-1}{1}$ → $m = \frac{-1}{1}$ ↓ → • solid • shade below

$B = 200$

$12.50x + 6.25y \geq 1500$

$-12.50x \quad -12.50x$

$\frac{6.25y}{6.25} \geq \frac{-12.50x}{6.25} + \frac{1500}{6.25}$

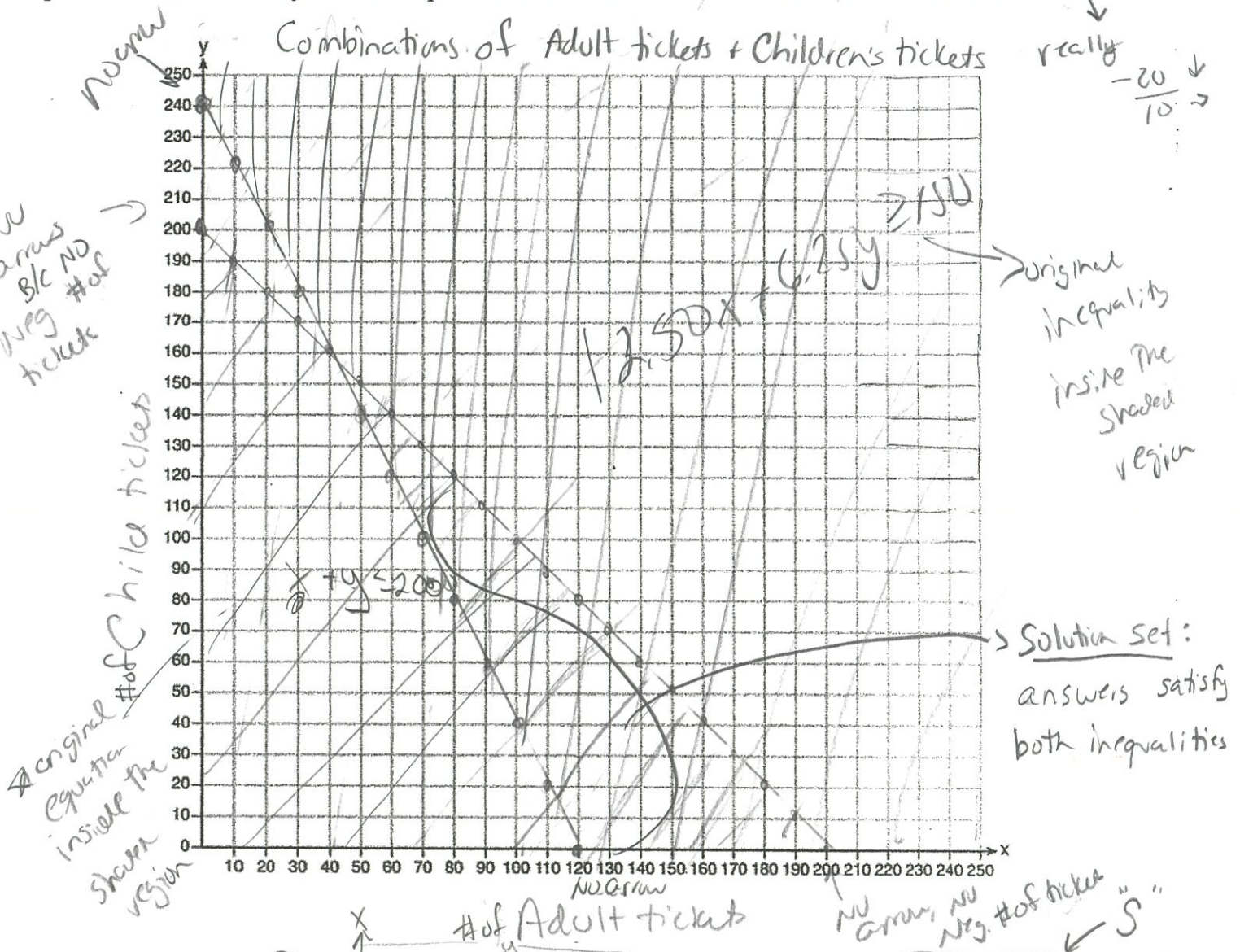
$y \geq -2x + 240$

$m = \frac{-2}{1}$ ↓ → • solid • shade above

$B = 240$

really $\frac{-20}{10}$ ↓ →

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



Marta claims that selling 30 adult tickets and 80 child tickets will result in meeting the cinema's goal. Explain whether she is correct or incorrect, based on the graph drawn.

NO, she is NOT correct b/c the point is not in the solution set (where the shadings intersect) and therefore it won't satisfy both inequalities (They won't reach their goal)

$\$ + \$ = \$$ $\quad\quad$ $\# + \# = \#$

(3) Suppose you have two jobs, babysitting, which pays \$5 per hour, and bagging groceries, which pays \$6 per hour. You can work no more than 20 hours each week, but you need to earn at least \$90 per week. $\leq$ $\geq$

Define the variables and write the systems of inequalities that represents this situation.

L

let x = the # of hours babysitting

y = the # of hours bagging groceries

I

$5x + 6y \geq 90$

$x + y \leq 20$

Based off the system above, graph the inequalities and shade the solution set.

$5x + 6y \geq 90$

$-5x \quad\quad -5x$

$\frac{6y}{6} \geq \frac{-5}{6}x + \frac{90}{6}$

$y \geq -\frac{5}{6}x + 15$

$m = -\frac{5}{6}$

$B = 15$

- Solid
- Shade above

$x + y \leq 20$

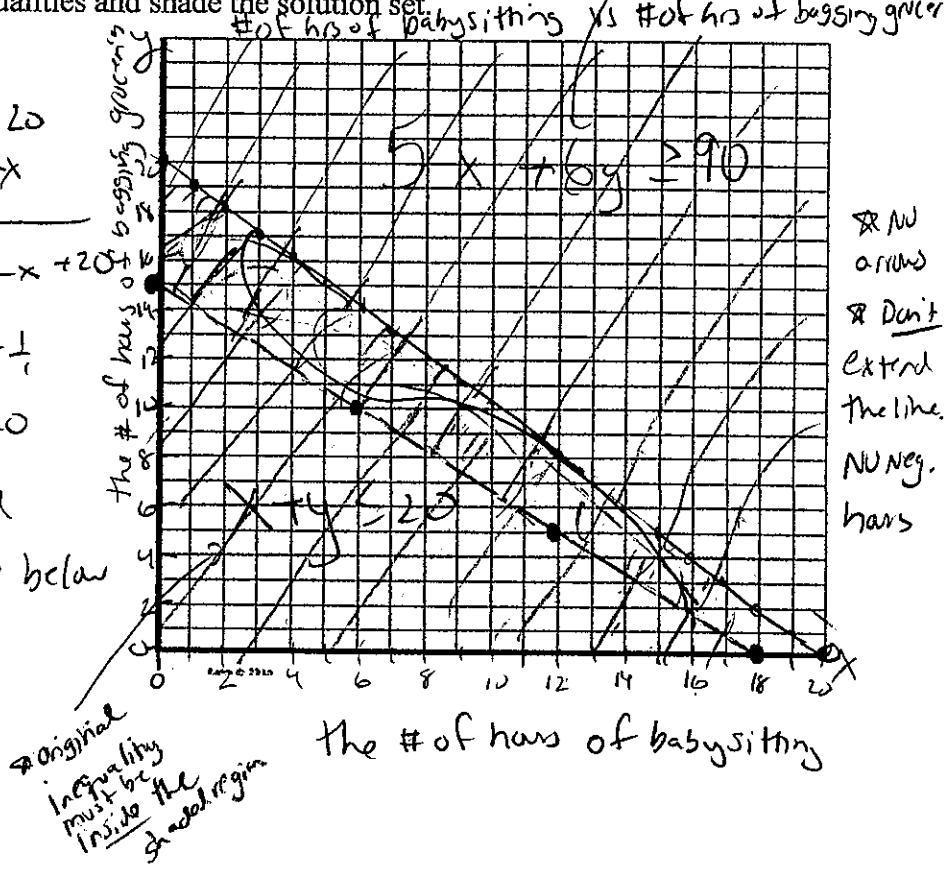
$-x \quad\quad -x$

$y \leq -x + 20$

$m = -1$

$B = 20$

- solid
- shade below



What does the shaded region represent? (in the context of the problem)

The shaded region represents the combinations of the # of hrs babysitting and the # of hrs bagging groceries that will allow you to earn at least \$90 per week while working no more than 20 hours

$ + # = # ≥ # + # = #

(4) An on-line electronics store must sell at least $2500 worth of printers and computers per day. Each printer costs $50 and each computer costs $500. The store can ship a maximum of 15 items per day.

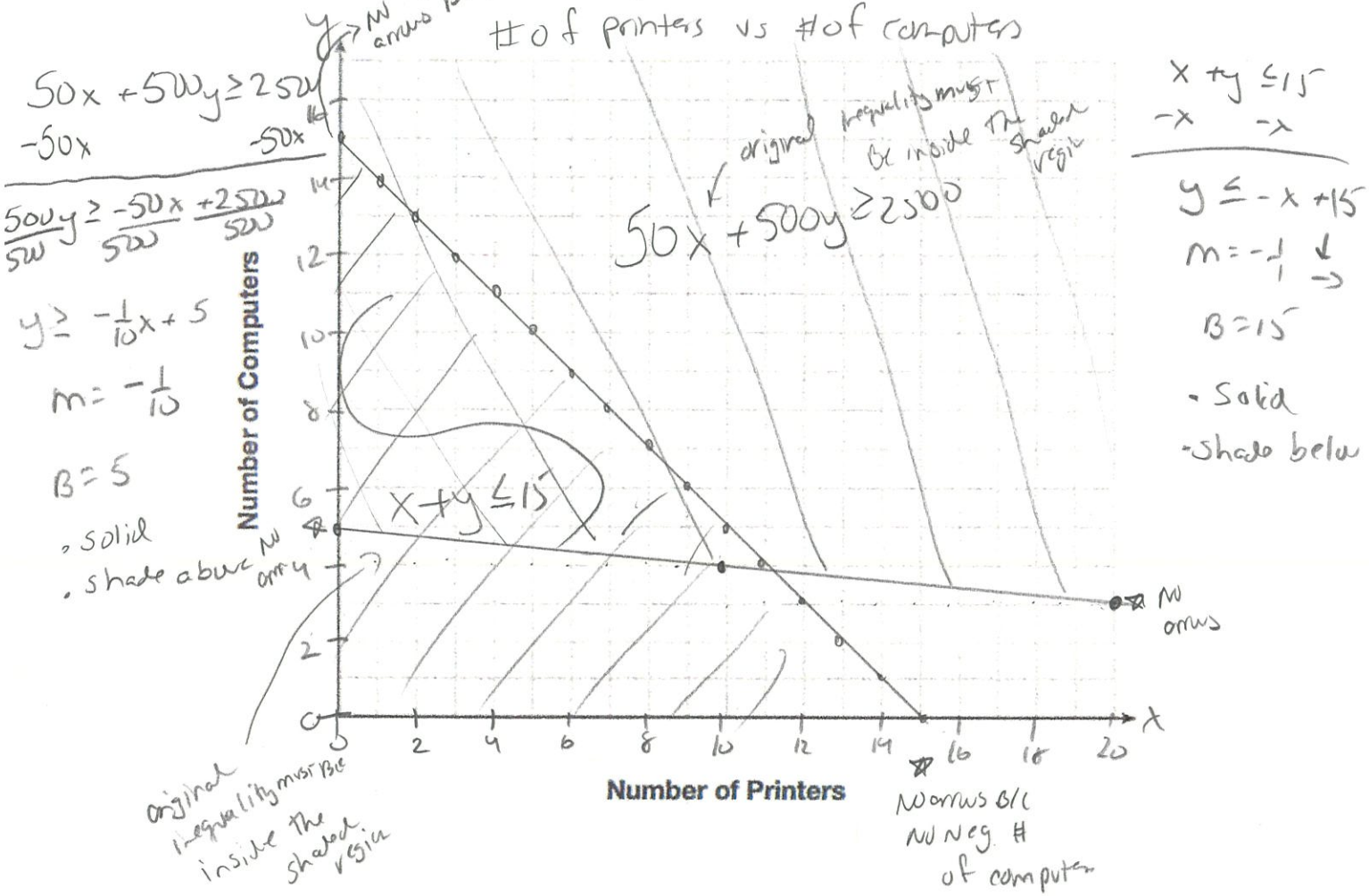
L

Let x = # of printers
y = # of computers

I ≤

$50x + 500y \geq 2500$
$x + y \leq 15$

On the set of axes below, graph a system of inequalities that models these constraints.



$50x + 500y \geq 2500$
$-50x \quad -50x$

$\frac{500y}{500} \geq \frac{-50x}{500} + \frac{2500}{500}$

$y \geq -\frac{1}{10}x + 5$

$m = -\frac{1}{10}$

$B = 5$

- solid
- shade above N arrow

$x + y \leq 15$
$-x \quad -x$

$y \leq -x + 15$

$m = -\frac{1}{1}$ ↓ →

$B = 15$

- Solid
- Shade below

Determine a combination of printers and computers that would allow the electronics store to meet all of the constraints. Explain how you obtained your answer.

4 printers & 7 computers. I graphed each function & then saw where the shading intersected. I then chose a whole # of printers & a whole # of computers from the solution set (where the shadings intersect) Since you can't have part of a printer or computer.