

Name: Key

Date: _____

1. Tanya is making homemade greeting cards. The data table below represents the amount she spends in dollars, $f(x)$, in terms of the number of cards she makes, x .

x	$f(x)$
4	7.50
6	9
9	11.25
10	12

$$m = \frac{9 - 7.50}{6 - 4} = \frac{1.5}{2}$$

$$m = 0.75$$

Write a linear function, $f(x)$, that represents the data.

Explain what the slope and y-intercept of $f(x)$ mean in the given context.

$$f(x) = 0.75x + 4.50$$

* It costs \$0.75 per greeting card.

* It costs \$4.50 in supplies.

2. Two friends went to a restaurant and ordered one plain pizza and two sodas. Their bill totaled \$15.95. Later that day, five friends went to the same restaurant. They ordered three plain pizzas and each person had one soda. Their bill totaled \$45.90.

Write and solve a system of equations to determine the price of one plain pizza. [Only an algebraic solution can receive full credit.]

$$\begin{aligned} -3(p + 2s) &= 15.95 \\ 3p + 5s &= 45.90 \\ \hline -3p - 6s &= -47.85 \\ 3p + 5s &= 45.90 \\ \hline -s &= -1.95 \\ s &= 1.95 \end{aligned}$$

$$\begin{aligned} p + 2(1.95) &= 15.95 \\ p + 3.90 &= 15.95 \\ p &= 12.05 \end{aligned}$$

3. For a class picnic, two teachers went to the same store to purchase drinks. One teacher purchased 18 juice boxes and 32 bottles of water, and spent \$19.92. The other teacher purchased 14 juice boxes and 26 bottles of water, and spent \$15.76.

Write a system of equations to represent the costs of a juice box, j , and a bottle of water, w .

Kara said that the juice boxes might have cost 52 cents each and that the bottles of water might have cost 33 cents each. Use your system of equations to justify that Kara's prices are *not* possible.

$$\begin{aligned} w &= 0.2 \\ j &= 0.6 \end{aligned}$$

Solve your system of equations to determine the actual cost, in dollars, of each juice box and each bottle of water.

$$\begin{aligned} 18j + 32w &= 19.92 \\ 14j + 26w &= 15.75 \\ \hline 18(.52) + 32(.33) &= 19.92 \\ 19.92 &= 19.92 \\ \hline 14(.52) + 26(.33) &= 15.75 \\ 15.86 &\neq 15.75 \end{aligned}$$

4. A contractor has 48 meters of fencing that he is going to use as the perimeter of a rectangular garden. The length of one side of the garden is represented by x , and the area of the garden is 108 square meters.

Determine, algebraically, the dimensions of the garden in meters.

$$2x + 2w = 48$$

$$\frac{2w}{2} = \frac{-2x + 48}{2}$$

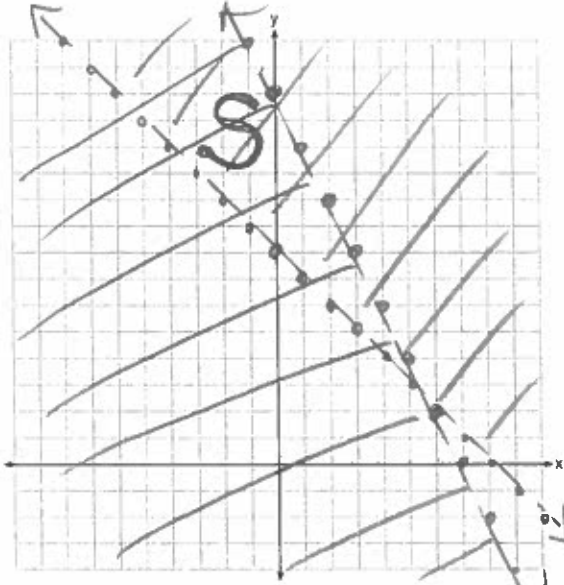
$$w = -x + 24$$

$$\begin{aligned} x(-x + 24) &= 108 \\ -x^2 + 24x &= 108 \\ 0 &= x^2 - 24x + 108 \\ 0 &= (x - 18)(x - 6) \end{aligned}$$

$$\begin{aligned} x &= 18 \\ \text{or} \\ x &= 6 \end{aligned}$$

5. The sum of two numbers, x and y , is more than 8. When you double x and add it to y , the sum is less than 14.

Graph the inequalities that represent this scenario on the set of axes below.



Kai says that the point $(6, 2)$ is a solution to this system. Determine if he is correct and explain your reasoning.

No b/c the lines do not include the values on them b/c it is dashed.

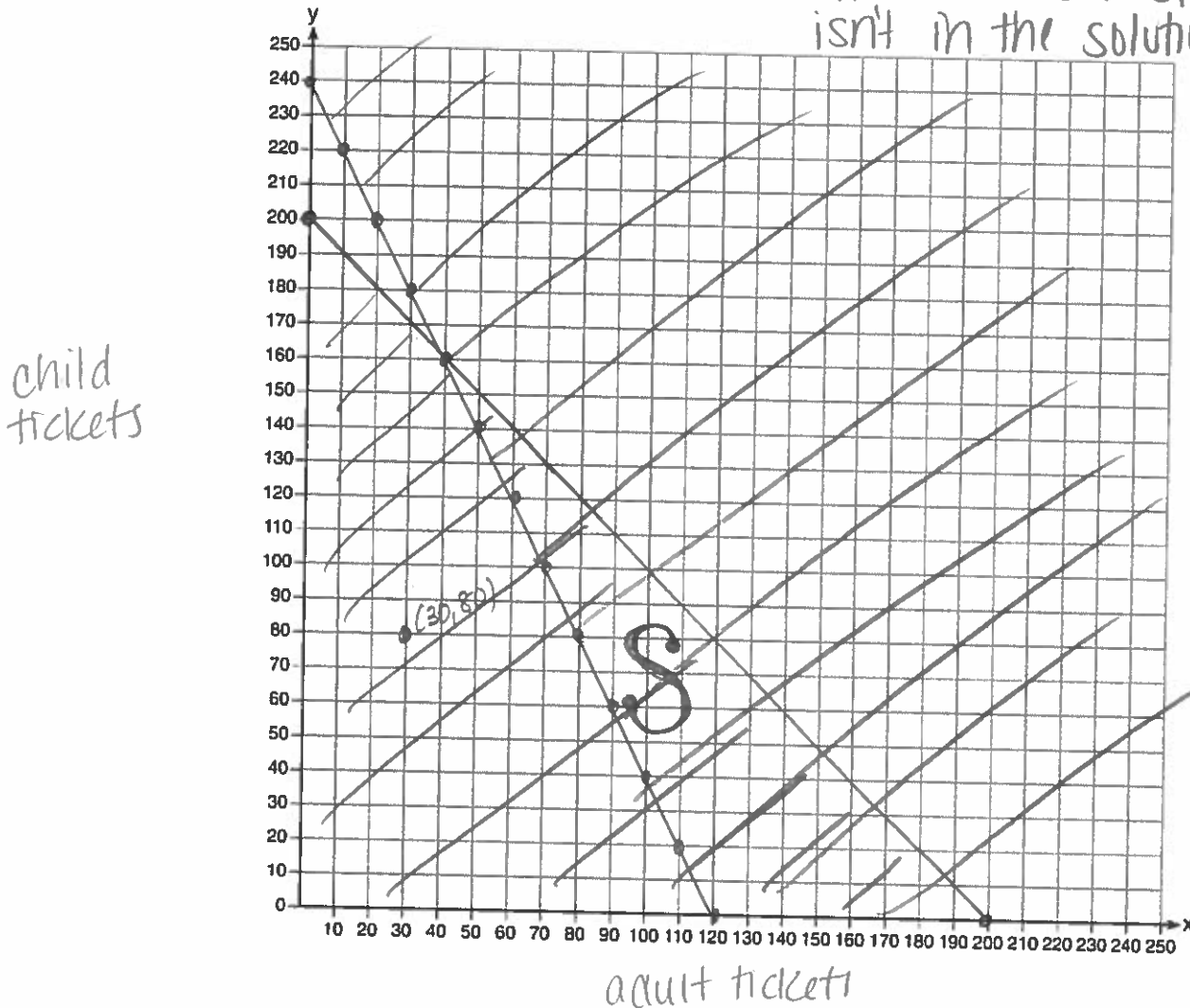
$$x + y > 8 \longrightarrow y > -x + 8$$
$$2x + y < 14 \longrightarrow y < -2x + 14$$

6. 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.

Graph the solution to this system of inequalities on the set of axes below. 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. *she is incorrect b/c (30, 80) isn't in the solution area.*



$$\begin{array}{r}
 x + y \leq 200 \quad \longrightarrow \quad y \leq -x + 200 \\
 12.50x + 6.25y \geq 1500 \\
 \hline
 -12.50x \quad \quad \quad -12.50x
 \end{array}$$

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

$$y \geq -2x + 240$$

$$\frac{-2}{1} \times \frac{5}{5} = \frac{-10}{5} = \frac{-20}{10}$$

