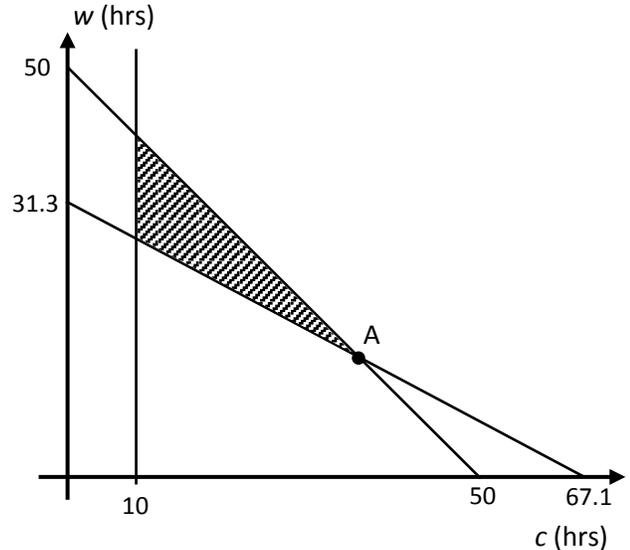


**Algebra 1 CC
Assignment #52
Modeling with Systems of Inequalities**

*1. Jody is working two jobs, one as a carpenter and one as a website designer. He can work at most 50 hours per week and makes \$35 per hour as a carpenter and \$75 an hour as a website designer. He wants to make at least \$2350 per week but also wants to work at least 10 hours per week as a carpenter. Let c represent the hours he works as a carpenter and let w represent the hours he works as a website designer.

- Write a system of inequalities that models this scenario.
- What is the maximum amount of money that Jody can make in a week given the system in (a)? Explain your reasoning.
- The graph of the system is shown below with its solutions shown shaded. Three lines are graphed. Label each with its equation.
- Find the coordinates of point A by solving a system of equations by Elimination.
- What does the value of c that you found in the solution to part (d) represent about the number of hours Jody can work as a carpenter. Explain your thinking.



2. For each of the following, create a system of inequalities that models the scenarios presented. **You do not need to solve the systems.**

- Two pumps at a local water facility can only run individually. They will run for at least 18 hours in a day but obviously no more than 24 hours in a day. Pump 1 can move 120 gallons per hour while Pump 2 can move 200 gallons per hour. In total the two pumps must move at least 3,000 gallons of water per day. If x represents the number of hours that Pump 1 runs and y represents the number of hours that Pump 2 runs.
- Dave is buying popcorn and sodas for his son and his three friends that he brings to the movies (four kids total). He needs to buy at least one of the two items for each of the four. Popcorn costs \$2.50 per bag and sodas cost \$4.00 each. Dave can spend at most \$20. If s represents the number of sodas he buys and p represents the number of bags of popcorn, then write a system that models this scenario.

R1. The graph of $f(x)$ is shown to the right. What is the value of $f(0)$?

R2. For the following equations, identify the slope, y-intercept and x-intercept

(a) $y = \frac{2}{3}x - 4$

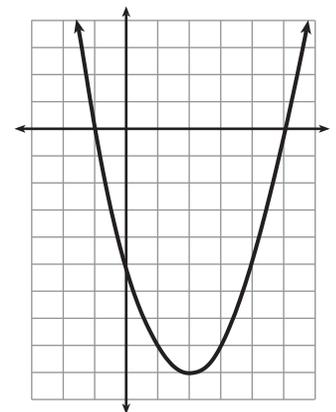
(b) $y = -\frac{5}{2}x + 7$

R3. Which domain would be the most appropriate set to use for a function that predicts the number of household online-devices in terms of the number of people in the household?

- a) integers b) whole numbers c) irrational numbers d) rational numbers

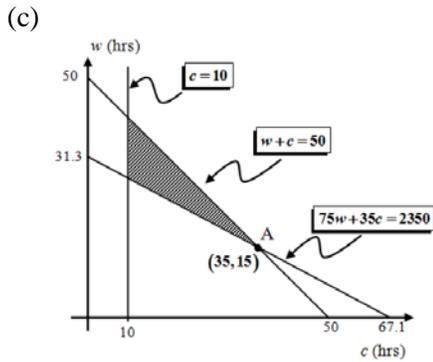
***R4.** The graph of a linear equation contains the points (3, 11) and (-2, 1). Which point also lies on the graph?

- a) (2, 1) b) (2, 4) c) (2, 6) d) (2, 9)



1. (a) $w + c \leq 50$
 $75w + 35c \geq 2350$
 $c \geq 10$

(b) To maximize the amount of money Jody makes, he should work the most hours as a website designer, which means the least hours as a carpenter, which is 10, leaving him 40 hours to work as a website designer:
 $= 75(40) + 35(10) = \$3,350$



(d) (35,15)

(e) 35 hours working as a carpenter, represents the maximum number of hours Jody can work as a carpenter and still make at least \$2350 per week

2. (a) $x + y \geq 18$
 $x + y \leq 24$
 $120x + 200y \geq 3000$

(b) $s + p \geq 4$
 $4s + 2.50p \leq 20$

R1. -5

R2. (a)

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

$$b = -4$$

$$x \text{ intercept} = 6$$

(b)

$$m = -\frac{5}{2}$$

$$b = 7$$

$$x \text{ intercept} = \frac{14}{5}$$

R3. b

R4. d