

Name:

APPLICATION: Income and Linear Inequalities**Level 1****ACTIVITY:** [Card Sort](#)

1. Match each word problem to the corresponding graph, inequality, and solutions. Write your answers or paste the cards below.

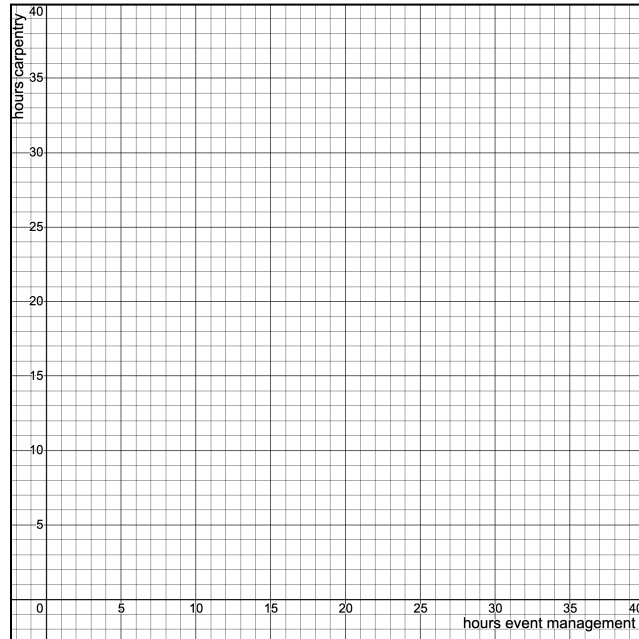
Match 1	
Match 2	
Match 3	
Match 4	

Level 2

1. Sana works part-time in event management earning \$20 per hour. She also does freelance carpentry projects for \$25 per hour. She wants to earn more than \$750 per week.

a. Write an inequality to represent the scenario.

b. Graph the inequality.

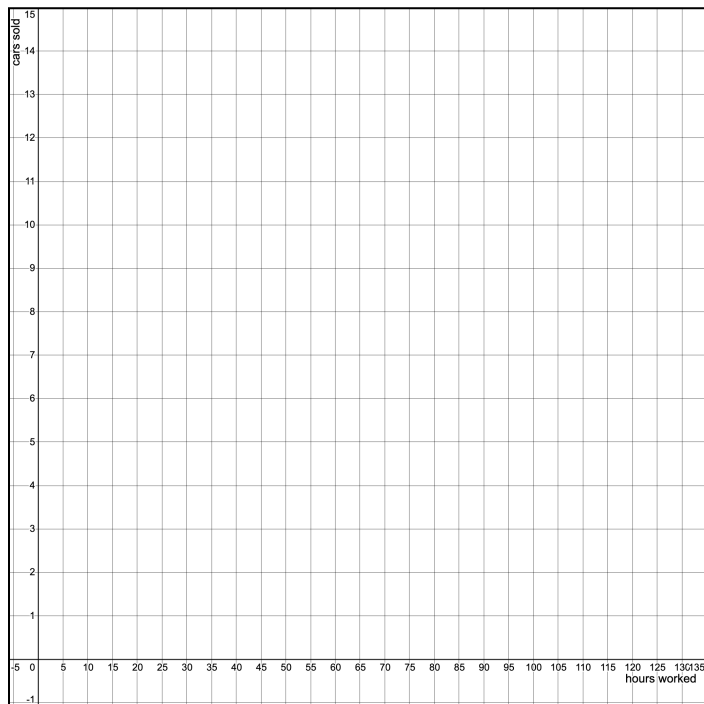


- c. Identify one possible solution to the inequality. Is it reasonable in this context? Why or why not?
- d. Sana covers her basic expenses with \$750, but wants to save up for a vacation. How much extra would she earn if she worked 30 hours in event management and 15 hours in carpentry?
- e. If Sana can't find any hours of carpentry work, at least how many hours would she need to work in event management to meet her basic needs?
- f. What is the fewest number of hours that Sana could work and still earn more than \$750? Justify your response.

2. Quentin works as a used car salesman, where he earns \$8 per hour and an average commission of \$260 per car sold. He wants to earn at least \$1040 per week.

a. Write an inequality to represent this scenario, where x represents hours worked and y represents cars sold.

b. Graph the inequality.



c. The point $(35, 3)$ is a solution. What does it represent in this context?

d. If Quentin only sells two cars that week, at least how many hours would he need to work?

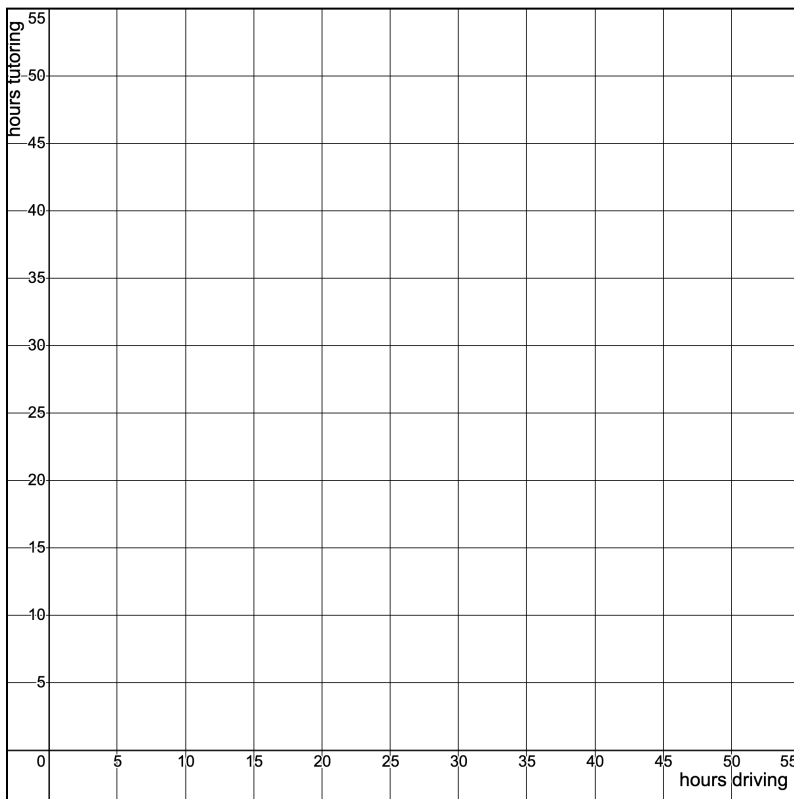
e. If Quentin wants to work a standard 40-hour workweek, at least how many cars would he need to sell?

f. Identify one point that IS a solution but is NOT reasonable in the real-world context. Justify your response.

Level 3

1. Nathan needs to earn at least \$880 per week. He works as an Uber driver, earning an average of \$16 per hour, and as a tutor, earning \$20 per hour.

- Write an inequality to represent this situation, where x represents hours driving and y represents hours tutoring.
- Graph the inequality.



- Identify a solution to the inequality.
- $(55, 0)$ is a solution to the inequality. Would that be an optimal choice for Nathan? Why or why not?
- Nathan wants to work at most 50 hours per week. Write an inequality representing that additional constraint. Then, graph it on the same coordinate plane above.
- Is there any way Nathan can earn at least \$880 while working 50 hours or less? Justify your response.

- 2. Noel is a waiter in a restaurant who is paid the federal minimum wage for tipped workers: \$2.13. They also keep 70% of the tips left by their tables. So, they always earn at least \$2.13 per hour, but their actual earnings vary.**
- Write an inequality to represent Noel's earnings, y , if they work x hours.
 - Graph the inequality using [Desmos](#).
 - The point $(40, 200)$ is a solution to the inequality. What does that mean in this context?
 - At that point, how much did Noel take home from tips?
 - At that point, how much did diners leave in tips total?
- 3. Although Noel's base pay is only \$2.13, federal law says their total earnings, including tips, must at least meet the minimum wage of \$7.25 per hour (or sometimes the state minimum wage).**
- Write a new inequality representing Noel's earnings, y , if they work x hours.
 - Graph that inequality on the same [Desmos](#) graph as Question 2.
 - If Noel works 30 hours, what is the minimum they can earn?
 - Identify one point that was a solution to the inequality in Question 1 but is NOT a solution to your new inequality.
- 4. If Noel takes home less than the federal minimum wage, their employer is required to make up the difference.**
- If Noel works 40 hours and earns \$290, how much does their employer owe them?
 - If Noel works 50 hours and keeps \$140 in tips, how much does their employer owe them?
 - If Noel works 20 hours and their diners leave a total of \$60 in tips, how much does their employer owe them?