

Lesson 22: Situations with Constraints

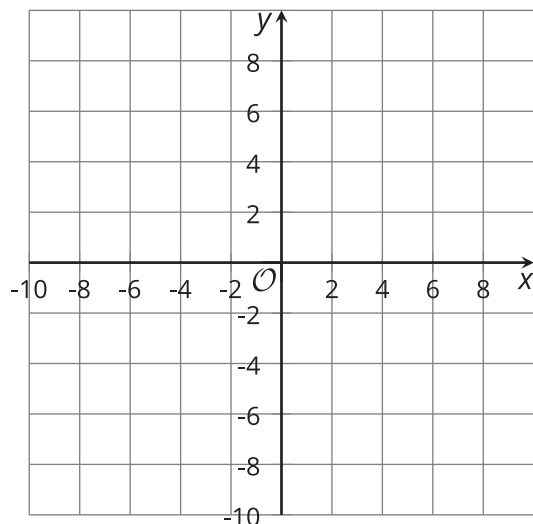
- Let's study situations that have constraints.

22.1: Graph Features of Inequalities

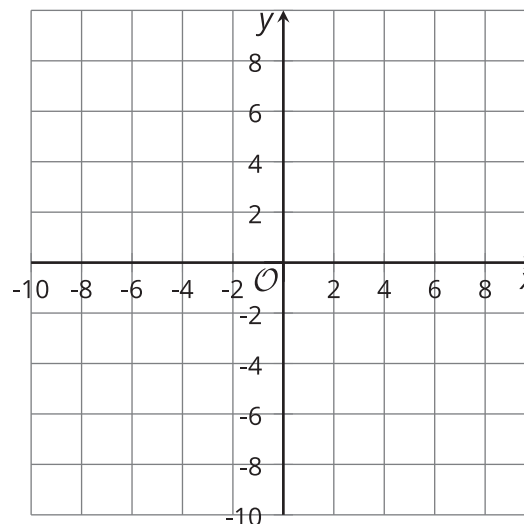
For each inequality:

1. What is the x -intercept of the graph of its boundary line?
2. What is the y -intercept of the graph of its boundary line?
3. Plot both intercepts, and then use a ruler to graph the boundary of the inequality.

$$2y \geq 4x - 8$$



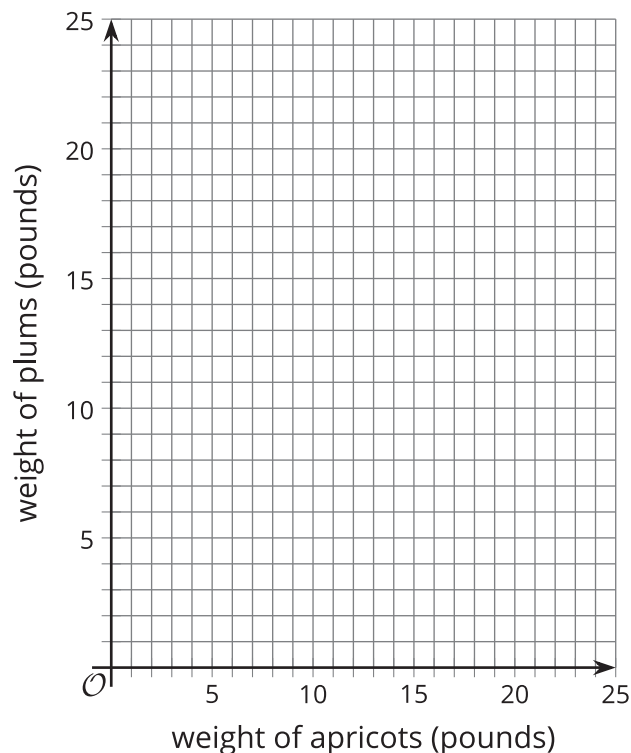
$$2x + 3y < 12$$



22.2: Fruits and Running

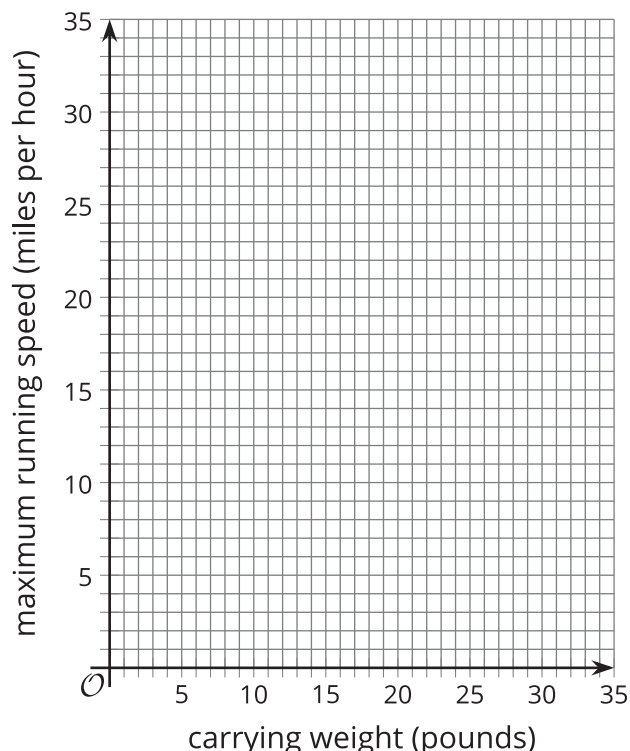
Write an equation that helps to answer the question about the situation. Then draw a graph that represents the equation.

- Jada goes to an orchard to pick plums and apricots to make jam. She picks 20 pounds of fruit altogether. If she picks a pounds of apricots, how many pounds of plums does she pick?



- Consider the point $(5, 16)$. Is it possible for the weight of the fruit to be represented by that point in this situation? Explain your reasoning.

2. In a video game, a character can run at a top speed of 30 miles per hour, but each additional pound that the character carries lowers the maximum running speed by 1 mile per hour. What is the maximum running speed of the character when they are carrying w pounds?



- a. Consider the point $(10, 15)$. Is it possible for a character in this game to be represented by that point in this situation? Explain your reasoning.

22.3: Matching Graphs and Inequalities

1. Take turns with your partner to match graphs, inequalities, and constraints.
 - a. For each match that you find, explain to your partner how you know it's a match.
 - b. For each match that your partner finds, listen carefully to their explanation. If you disagree, discuss your thinking and work to reach an agreement.