Unit 2 Lesson 22: Situations with Constraints
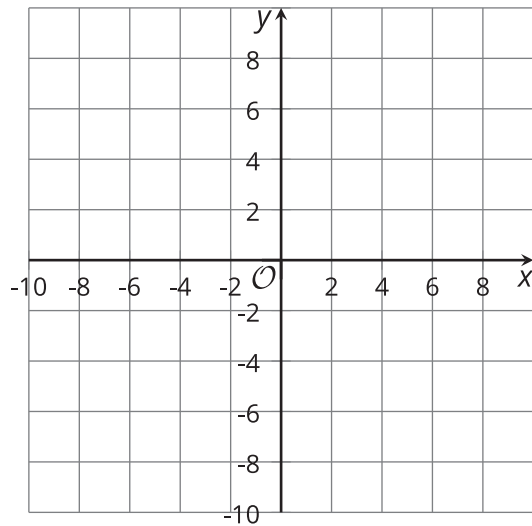
1 Graph Features of Inequalities (Warm up)
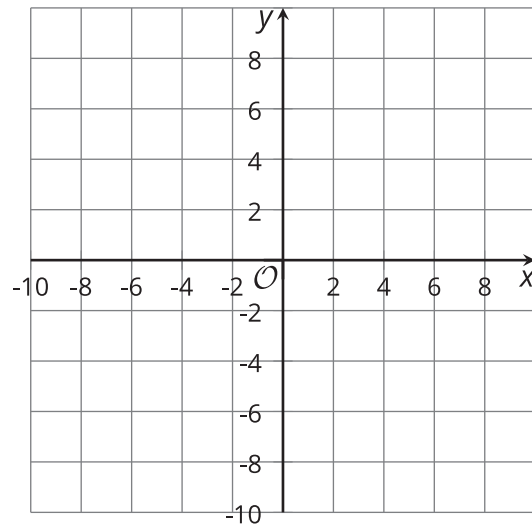
Student Task Statement

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.
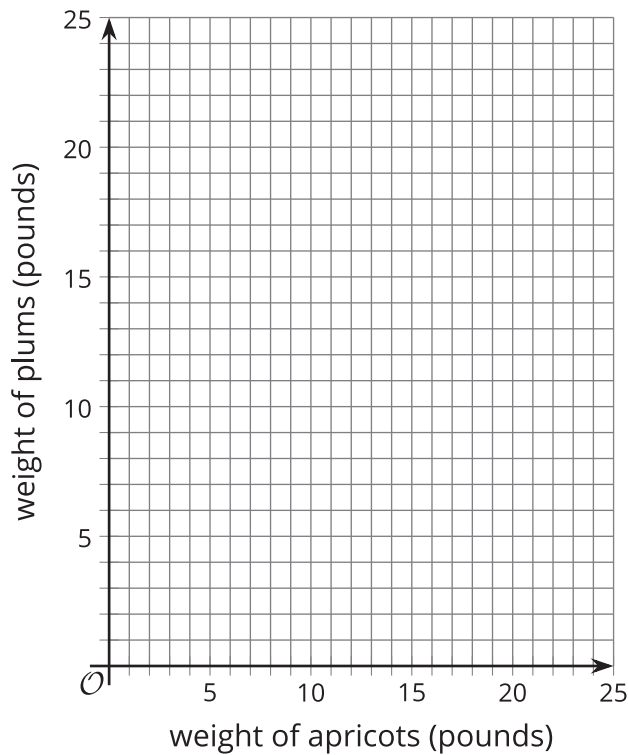
$2y \geq 4x - 8$ $2x + 3y < 12$

2 Fruits and Running
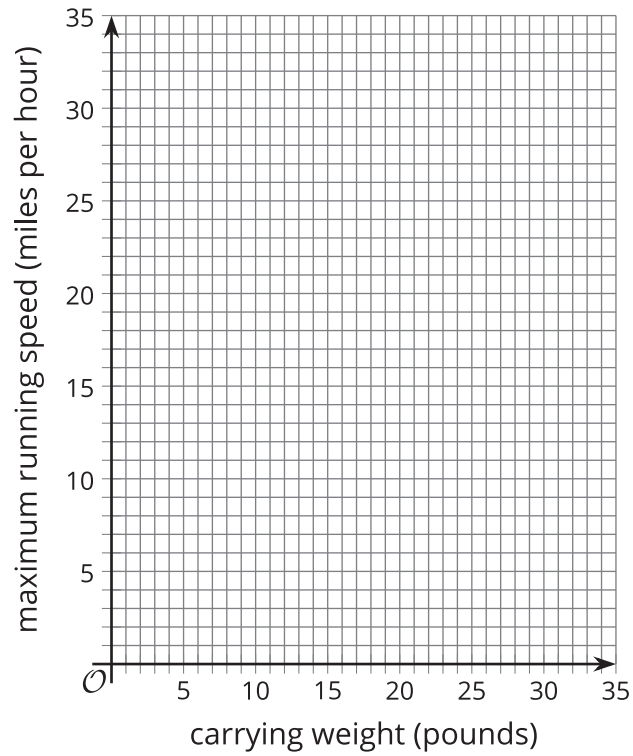
Student Task Statement

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

1. 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?

a. 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.

3 Matching Graphs and Inequalities

Student Task Statement

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.