## 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?
* 
	1. 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.
1. 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?
* 
	1. 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.
	1. For each match that you find, explain to your partner how you know it’s a match.
	2. For each match that your partner finds, listen carefully to their explanation. If you disagree, discuss your thinking and work to reach an agreement.



© CC BY 2019 by Illustrative Mathematics®