



Alan's camping troop hikes down from their campsite at an elevation of 4800 feet to the bottom of the mountain. They hike down at a rate of 20 feet per minute.

1. Write a function,  $h(m)$ , to show the troop's elevation as a function of time in minutes.

$$h(m) = -20m + 4800$$

2. Analyze the function.

- a. Identify the independent and dependent quantities and their units.

**Independent Quantity (IQ)** = time (in minutes)

**Dependent Quantity (DQ)** = height (in feet)

- b. Identify the rate of change and explain what it means in terms of this problem situation.

**Rate of Change** =  $-20$ . It represents a decrease of 20 feet every minute.

- c. Identify the  $y$ -intercept and explain what it means in terms of this problem situation.

**$y$ -intercept** = 4800. This means the troop starts their hike at an elevation of 4800 feet.



- d. What is the  $x$ -intercept and explain what it means in terms of this problem situation?

$$0 = -20m + 4800$$

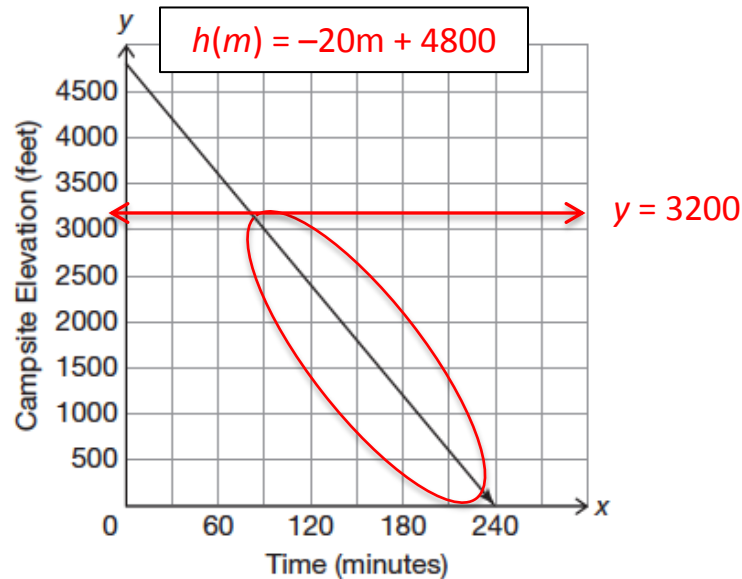
$$-4800 = -20m$$

$$240 = m$$

The  **$x$ -intercept** is (240, 0). The hikers will be at the bottom of the mountain in 240 minutes or 4 hours.



3. Label the function on the coordinate plane.



4. Use the graph to determine how many minutes passed if the troop is below 3200 feet. Draw an oval on the graph to represent this part of the function and write the corresponding inequality statement.

$$m > 80$$

5. Write and solve an inequality to verify the solution set you interpreted from the graph.

$$-20m + 4800 < 3200$$

$$-20m < -1600 \quad m > 80$$

6. Compare and contrast your solution sets using the graph and the function. What do you notice?

The solution sets are the same.



7. Complete the table by writing the corresponding inequality statement that represents the number of minutes for each height.

$h(m)$	$m$
$h(m) > 3200$	$m < 80$
$h(m) \geq 3200$	$m \leq 80$
$h(m) = 3200$	$m = 80$
$h(m) < 3200$	$m > 80$
$h(m) \leq 3200$	$m \geq 80$

Look at the graph at 80 and  $m$ !

- a. Compare each row in the table shown. What do you notice about the inequality signs?

The inequality signs are reversed!



- b. Explain your answer from part (a). Use what you know about solving inequalities when you have to multiply or divide by a negative number.

The function has a negative slope causing the inequality signs to reverse.