



## How Long to Reach the Summit?



Mount Bierstadt Trail is a popular 6.8 mile out-and-back trail in Silver Plume, Colorado. It is one of Colorado's iconic 14-ers, with a peak of 14,066 feet. The table below gives the elevation of a hiker climbing Mt. Bierstadt at selected times on his trip. Time is given in hours and elevation is given in feet.

1. Sketch a rough graph of this hiker's elevation over time.



Time (hours)	Elevation (above sea level)
0	11,629 feet
1	11,900 feet
2.5	13,060 feet
4	14,066 feet
5	12,619 feet
5.5	11,629 feet

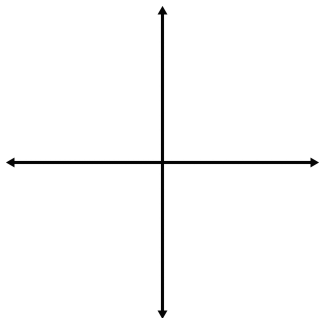
2. Can the hiker's elevation be considered a function? Why or why not?
3. Explain why each elevation (except the summit) is reached at least twice on the hiker's journey.
4. Suppose that we wanted to find the *inverse*: to figure out the time at which the hiker reached a certain elevation.
  - a. Identify the input and output of this inverse relation.
  - b. Estimate the time at which the hiker was at an elevation of 10,500 feet or explain why this is not possible.
  - c. Explain how you can use the graph to estimate at what time the hiker was half-way up the mountain (12,978 feet).
5. Is the inverse relation a function? How do you know?

## Lesson 5.3 —Graphs of Inverse Functions

QuickNotes

### Check Your Understanding

1. The function  $H$  gives the temperature of a town,  $H(t)$ , in °Fahrenheit,  $t$  days into the calendar year.
  - a. Is  $H$  a one-to-one function? How do you know?
  - b. Explain what this tells you about whether or not  $H^{-1}$  is a function.
2. Sketch the graph of  $f(x) = (x - 3)^2$ . Is the inverse of  $f$  a function? Support your answer with information from the graph. If not, how could you restrict the domain of  $f$  so that the inverse is a function?



3. Find the inverse of  $y = \sqrt{x - 4}$  and state its domain and range.