There are many ways to plot points on a map using latitude/longitude; this section describes one method. The grid system of intersecting lines that is used in the latitude/longitude coordinate system makes it easier to plot a point. Once you know how to plot points you can use the same method to determine the coordinates of a point. Examples of when you may need to plot a point on a map or determine the coordinates of a point include:

- To map the location of a safety hazard.
- To communicate the location of a potential landing zone
- To assist with navigation.

When working with latitude/longitude coordinates, it is very important to clearly communicate (verbally or written) the coordinates to other personnel. It is extremely easy to say the wrong latitude or longitude.

The method described in this section is used only for points located in the northern hemisphere; if the point is in the southern hemisphere there is a different process.

**Rulers**

Two types of rulers, engineer’s ruler and latitude/longitude ruler, are often used to measure latitude and longitude of a point or to plot coordinates. Graduation marks on the ruler may be in seconds, tenths of a minute, or other unit. With either type of ruler, latitude needs to be measured with the ruler oriented north and south; whereas for measuring longitude the ruler needs to be placed diagonally (since the distance between longitude lines is not constant).

The engineer’s ruler or scale needs to have 20 graduations per inch. The primary function of the engineer’s ruler is to measure distance: 1 inch equals 2000 feet on a 1:24,000 scale topographic map. An engineer’s ruler or scale, with 20 graduations per inch, can be used for measuring latitude/longitude on a 1:24,000 scale topographic map where each graduation is equal to 1 second.

The latitude/longitude ruler usually has minutes and seconds on one edge and decimal minutes on the other edge. These rulers are specifically made for different map scales and they come in different increments. Make sure the scale on the ruler matches the map scale.
Plotting Latitude and Longitude

When plotting latitude/longitude, it may be helpful to draw the latitude/longitude lines on the map as illustrated in the image below. You can use these lines as a reference when plotting points.

The information below will illustrate the steps for plotting the coordinate 43°-23′-45″ latitude and 71°-08′-36″ longitude. An engineer’s ruler (each graduation equals one second) is used in the illustrations.

Steps for plotting the latitude coordinate 43°-23′-45″

1. On the map below, find the latitude lines that are identified with tick marks.
Identify the first latitude line that is south of the given latitude coordinate. Determine how many minutes and/or seconds the southern latitude line is from the given latitude coordinate. To do this, subtract the southern latitude line coordinate from the given coordinate:

43 deg 23′ 45″ (given coordinate)
– 43 deg 22′ 30″ (southern latitude line coordinate)

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1′ 15″ or 75″ (difference) The resulting number of minutes and/or seconds is referred to as the “difference” and will be used in the next step.
3. Verify that the scale on the ruler matches the map scale. When measuring latitude, orient the ruler north to south. On the right side of the map, place the ruler with the “0” on the southern latitude line. Then, measure the “difference” (as determined in step 2) on the ruler and mark this point. Repeat this on the other side of the map.
4. Draw a line connecting the two points

Steps for plotting the longitude coordinate 71°-08′-36″
1. On the bottom of the map, find the longitude lines that are identified with tick marks.

2. Identify the first longitude line that is east of the given longitude coordinate and the first longitude line that is west of the given longitude coordinate. Draw these lines on the map because they will be used as a reference in step 3. Determine how many minutes and/or seconds the eastern longitude line is from the given longitude coordinate. To do this, subtract the eastern longitude line coordinate from the given coordinate: 
   - 71 deg 08' 36" (given coordinate) 
   - 71 deg 07' 30" (eastern longitude line coordinate) 

   \[ 1' 6" \text{ or } 66" \text{ (difference)} \]

   The resulting number of minutes and/or seconds is referred to as the “difference” and will be used in step 3.
3. Verify the scale on the ruler matches the map scale. When measuring longitude, orient the rule on a diagonal. Using the engineer’s ruler, place the 0 on the eastern longitude line and place the “15” (150 seconds) on the western longitude line that is 2.5 minutes (150 seconds) from the eastern line. Slide the ruler vertically (keeping the “0” and the “15” graduation marks on their respective longitude line) until the “difference” (as measured on the ruler) lines up with the previously drawn latitude line. Mark this point; it represents the latitude and longitude coordinate.

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