

Maps and Landforms

Each station has one or more maps. Examine the maps to answer all of the questions.

Palmyra Quadrangle

Find the town of Palmyra. Directly to its south is Bear Hill.

1. What is Bear Hill's relief (elevation change)?
2. What is Bear Hill's dimension the long way?
3. What is Bear Hill's dimension the short way?
4. The view shown on the map is from above. Draw the profile of Bear Hill as it would appear from the West. Draw another view of Bear Hill as it would appear from the North. Use the same scale as the map.

from the west

from the north

Laramie Quadrangle

1. What is the elevation of the City Springs?
2. What is the elevation of the sewage disposal plant?
3. How high above the river is West Laramie?
4. Some contours near the river are drawn as dotted brown lines. What do they mean?
5. There is a fairly flat area north of town, partly in square "22." It is bounded on the west, north, and south by much steeper terrain. Is this flat area a *basin* (surrounded by higher ground) or a *plateau* (surrounded by lower ground)? How can you tell?

Note several "oxbow" lakes near the river to the north and south of town.

6. Which way does the river flow?

Bright Angel Quadrangle

This map shows the main visitor area of the Grand Canyon. It is fairly difficult to read for several reasons. It is small, so the print is very fine. The contour lines are faint, as are the numbers for the elevations. Most critically, it contains information the other maps do not: geologic formations, indicated by colors and abbreviations.

1. At the rims of the canyon, both north and south, the top formation is the Kaibab (light blue, symbol Pk). Immediately beneath it is the Toroweap (dark blue, symbol Pt), and beneath it is the Coconino Sandstone (purple, symbol Pc). What is the elevation of the contact between the Pk and Pt near Tiyo Point (north rim)? What is the elevation of the same contact near Yavapi Point (south rim)?

2. Compare the slope in the Bright Angel Formation (light green, symbol Cba) to the slope in the Supai Formation (peach, symbol PPs). Which is steeper overall, and which is flatter overall?

3. In the lower middle of the map, to the south of the inner Gorge, are two tongue-like chartreuse features (pCs, Shinumo sandstone) rimmed in brown (Ct, Tapeats sandstone: a large disconformity!). The shape of the features indicates that they are valleys sloping downward to the northeast. The Shinumo Sandstone, but not the valleys, terminate at the black line labeled "Cremation Fault," which runs roughly NNW–SSE. On the other (downhill) side of the fault, the rock downhill of the Shinumo is the Tapeats, which is *uphill* of the Shinumo on the south side! Try to figure out how this could have happened. Draw a diagram to communicate your hypothesis.

Jaggar Peak Quadrangle, Bob Lakes Quadrangle

Jaggar Peak

1. Find Jaggar Peak. What is its shape?
2. Sweetwater Creek runs roughly NW–SE through this area. Estimate its profile along the transect given by the horizontal line labeled **34** between vertical lines **02** and **04**. Make a sketch of what you think its profile looks like.

Bob Lakes

1. Find Bob Creek. What direction does it flow?
2. Describe the valley occupied by Bob Creek.
3. Imagine a cross-section of the valley starting at Little Bob Lake and cutting straight across the valley to the same elevation on the other side. What is the shape of this cross-section across the valley?

North Fork Pickett Creek Quadrangle, Wiggins Peak Quadrangle

North Fork Pickett Creek

1. Below, sketch the pattern of Pickett Creek and the streams flowing into it.
2. The North Fork of Pickett Creek occupies the middle of the map, and flows south into Pickett Creek. How does the slope of this stream change from its source at Carter Mountain until it meets Pickett Creek?
3. How does the slope of the North Fork of Pickett Creek compare to the slope of the main branch?

Wiggins Peak

1. Brown Rock Canyon cuts through the middle of the map, and Wiggins Fork is to the Northwest. There is a drainage divide between them. Lay a sheet of acetate or Saran over the map between them and mark the divide between their drainages. Show it to me.

Bonner Springs Quadrangle, Donaldsonville Quadrangle

These areas both contain prominent rivers.

Bonner Springs

1. There are two ATSF rail lines and one UP line on this map. Why do you think the lines are routed where they are?
2. Where is the flattest region on this map?
3. Where is the steepest slope on the map?

Donaldsonville

Note the contour interval on this map.

1. From the Lapice Oil Field northwest to Donaldsonville and the river, how does the elevation change?
2. In general, how does the elevation change as you go *away* from the river?
3. There are several small streams in the center of the map. Do they flow toward or away from the Mississippi river?

Mount Whitney Quadrangle

Mount Whitney is the highest point in the 48 contiguous United States. Note that this map, unlike the others, reports elevation in meters rather than feet.

1. What is the profile of the landscape along a straight line from the peak of Mount Whitney to the peak of Mount Hitchcock? Sketch what you think it looks like.

Ickesburg Quadrangle

1. Most of the roads in this area run SW–NE. Why?
2. Road 74 runs approximately NW–SE here, but it is not straight. What determines its route?
3. How much does Buffalo Creek change its elevation from where it enters the map at the west to where it leaves at the east?
4. Sketch the general pattern of river drainages. Include the main streams and tributaries of Panther Creek, Raccoon Creek, and Buffalo Creek.

Landforms and Drainage of the 48 States

1. Describe the general appearance of the Appalachian Mountains, which run in a wavy path along the eastern part of the country.
2. Compare the general appearance of the Ouachita Mountains (south-central US) to the Appalachians.
3. Compare the appearance of the mountainous area south of the Snake River Plain to the mountains to its north and east.
4. Describe the prominent features of the coastlines of the Atlantic Ocean and Gulf of Mexico.
5. Before it defines the border between Texas and Mexico, the Rio Grande flows almost due south from Colorado through New Mexico, beginning in the San Luis Valley. Just south of the San Luis Valley, find the Jemez Mountains. Describe their shape.

The western part of the country is very mountainous, with three notable exceptions. Describe the appearance and form of these three relatively flat areas:

6. The Great Salt Lake Desert.
7. The Snake River Plain.
8. The Columbia Basin.