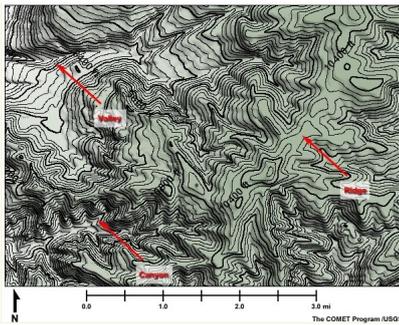


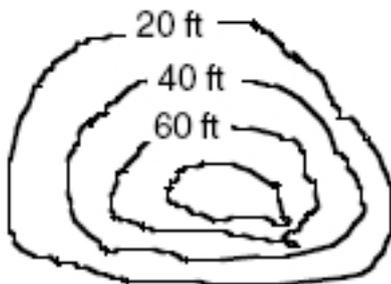
Contour Lines and Intervals

A contour line is a line drawn on a topographic map to indicate ground elevation or depression. A contour interval is the vertical distance or difference in elevation between contour lines. Index contours are bold or thicker lines that appear at every fifth contour line.



If the numbers associated with specific contour lines are increasing, the elevation of the terrain is also increasing. If the numbers associated with the contour lines are decreasing, there is a decrease in elevation. As a contour approaches a stream, canyon, or drainage area, the contour lines turn upstream. They then cross the stream and turn back along the opposite bank of the stream forming a "v". A rounded contour indicates a flatter or wider drainage or spur. Contour lines tend to enclose the smallest areas on ridge tops, which are often narrow or very limited in spatial extent. Sharp contour points indicate pointed ridges.

Example 1 - In the graphic below, what is the vertical distance between the contour lines?



Pick two contour lines that are next to each other and find the difference in associated numbers.
 $40 \text{ feet} - 20 \text{ feet} = 20 \text{ feet}$

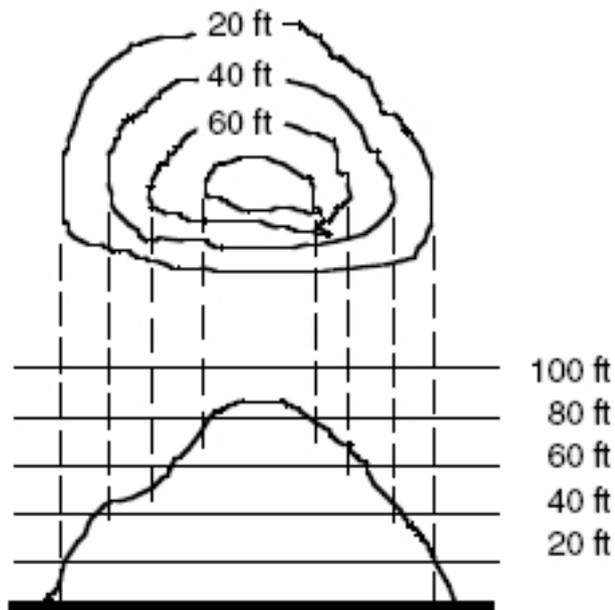
The contour lines in this figure are equally spaced. The even spacing indicates the hill has a

5.5 Contour Lines and Intervals

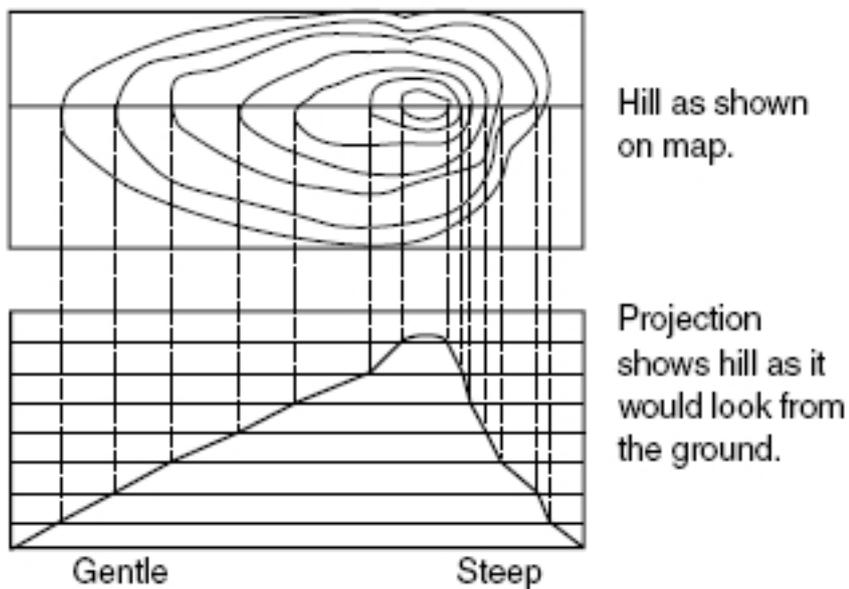
uniform slope. From the contour map, a profile can be drawn of the terrain.

Example 2 - Draw a profile showing the elevations of the contours.

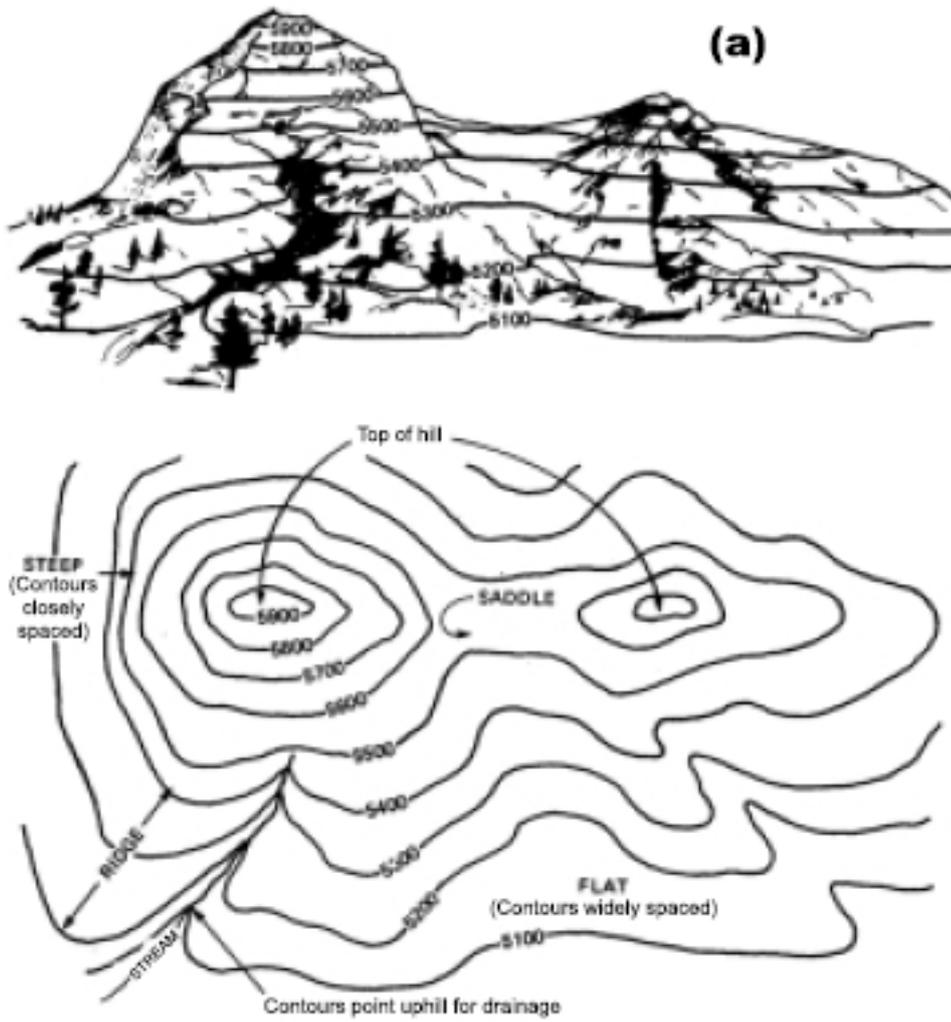
Note: The intervals are increasing, therefore, the contours indicate a hill. The peak is normally considered to be located at half the interval distance.



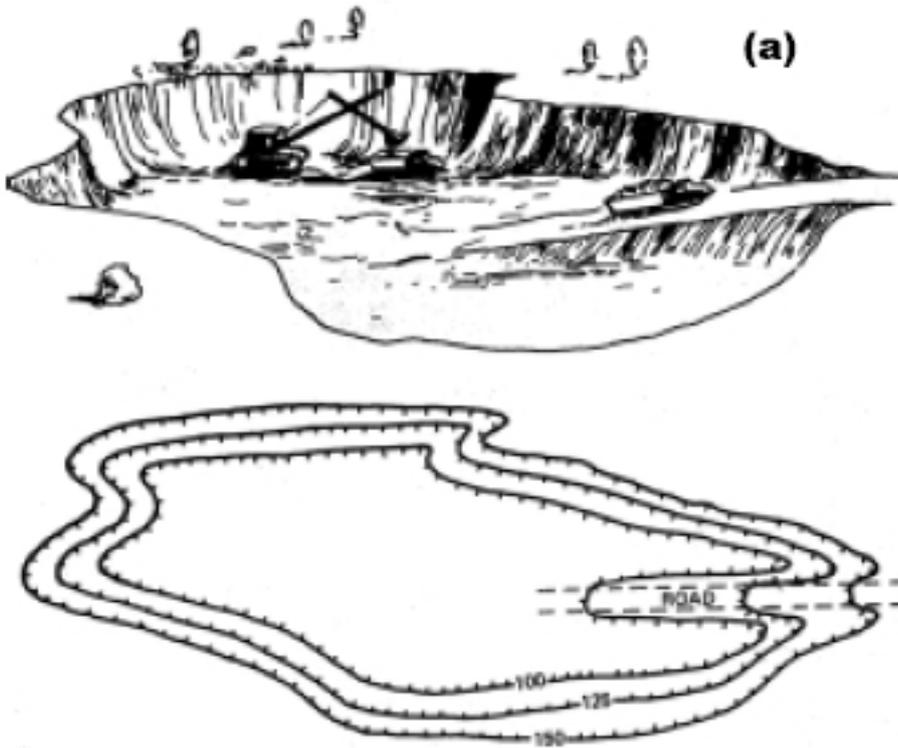
Widely separated contour lines indicate a gentle slope. Contour lines that are very close together indicate a steep slope.



5.5 Contour Lines and Intervals

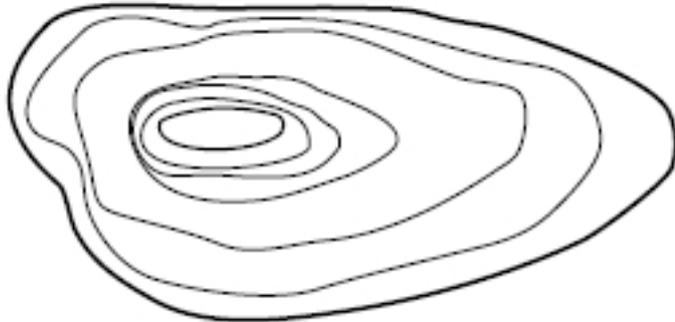


The figure above illustrates a topographic map with contour lines. Notice how a mountain saddle, a ridge, a stream, a steep area, and a flat area are shown with contour lines.



The figure above illustrates a depression and its representation using contour lines. Notice the tick marks pointing inward toward the center of the depression.

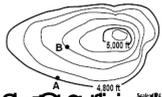
Practice



1. Is the figure shown here steeper at the top of the hill or the bottom?

- Top
- Bottom
- Not able to tell

Select the correct answer.



6. ~~100 ft~~ based on the available information? is not indicated. What contour interval can you select the correct answer?
Slope Percent from Topographic Map

The horizontal distance between points A and B can be measured with a scaled ruler and used to determine the slope percent.

$$\text{slope percent} = \text{rise/run} \times 100$$

Example 4 - What is the slope percent in Exercise 2 above?

$$\text{slope percent} = \text{rise/run} \times 100.$$

For this computation, the rise, or vertical ground distance, and run, or horizontal ground distance, are needed.

Step 1. Measure the horizontal map distance between points A and B to get the vertical ground distance.

The horizontal map distance measures 0.5 inches.

Step 2. Use the appropriate conversion factor to convert the horizontal map distance to horizontal ground distance.

$$0.5 \text{ in} \times 24,000 \text{ in/in} = 12,000 \text{ in}$$

Step 3. The desired unit is feet. Set up the cancellation table so all units will cancel, except the desired unit, feet.

$$\frac{12,000 \cancel{\text{in}}}{1} \times \frac{1 \text{ ft}}{12 \cancel{\text{in}}} = 1,000 \text{ ft}$$

Step 4. Use the slope percent equation and solve. The run is 1000 feet and the rise in elevation is 120 feet.

$$\text{slope percent} = \text{rise/run} \times 100$$

$$\text{slope percent} = (120\text{ft} / 1000\text{ft}) \times 100 = 12\%$$

Slope Worksheet - Use the information from the example above and complete the slope worksheet. Line 1 starts with the contour interval, not the projection point.

Slope Worksheet (to be completed)

5.5 Contour Lines and Intervals

Line		Input	
0	PP	Projection point	_____
1	CON INT	Contour interval, ft	_____
2	SLC	Map Scale	_____
3	CF	Conversion factor, ft/in	_____
4	#INTVLS	# of contour intervals	_____
5	RISE	Rise in elevation, ft	_____
6	MD	Map distance, in (between points)	_____
7	HZGD	Horizontal ground distance, ft	_____
Output			
SLP%	SLOPE%		_____

Slope Worksheet (completed)

5.5 Contour Lines and Intervals

Line		Input	
0		PP	Projection point A-B
1		CON INT	Contour interval, ft 40
2		SLC	Map Scale 1:24,000
3		CF	Conversion factor, ft/in 2,000
4		#INTVLS	# of contour intervals 3
5		RISE	Rise in elevation, ft 120
6		MD	Map distance, in (between points) 0.5
7		HZGD	Horizontal ground distance 1,000
Output			
	SLP%	SLOPE%	12