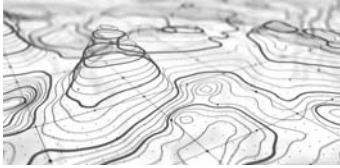


## Topographic Survey

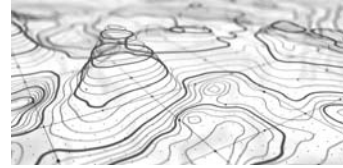
- **Topography** is the study of the shape and features of land surfaces.



- Topography is a field of geoscience and planetary science and is concerned with local detail in general, including not only relief but also natural and artificial features, and even local history and culture.

## Topographic Survey

- **Topography** is the study of the shape and features of land surfaces.



- This meaning is less common in the United States, where topographic maps with elevation contours have made "topography" synonymous with relief.

## Topographic Survey

- **Topography** - defined as the shape or configuration or relief or three-dimensional quality of a surface

- Topography maps are very useful for engineers when planning and locating a facility



## Topographic Survey

- U.S. Geological Survey (USGS) has developed maps for a large part of the US

- Napoleon Bonaparte received his first promotion because of ability to make and use maps



## Topographic Survey



Typical USGS Topographic Map

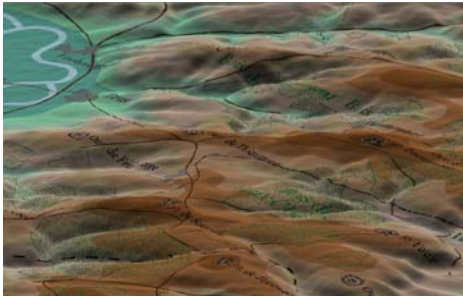


USGS Topographic Map of Mt. Shasta, CA - 1883

## Topographic Survey



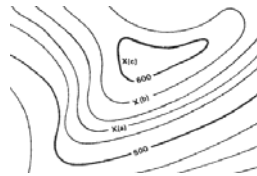
## Topographic Survey



## Topographic Survey

### Contours

The most common method of representing the topography of an area is to use **contour lines**



A **contour line** is an imaginary level line that connects points of equal elevation

## Topographic Survey

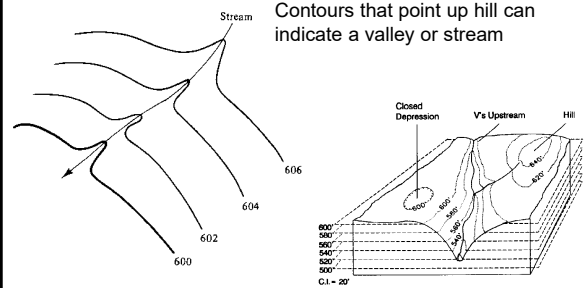
### Contours

There are several rules to note when viewing topographic maps:

- **The rule of Vs:** sharp-pointed V usually are in stream valleys, with the drainage channel passing through the point of the V, with the V pointing upstream.
- **The rule of Os:** closed loops are normally uphill on the inside and downhill on the outside, and the innermost loop is the highest area.
- **Spacing of contours:** close contours indicate a steep slope; distant contours a shallow slope. Two or more contour lines merging indicates a cliff.

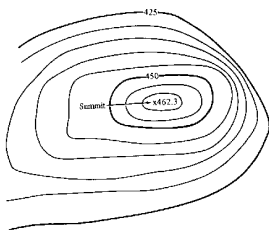
## Topographic Survey

### Contours



## Topographic Survey

### Contours

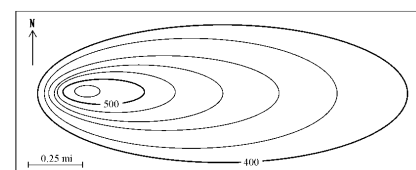


Imagine a hill that has its top sliced off with a really big knife

## Topographic Survey

### Contours

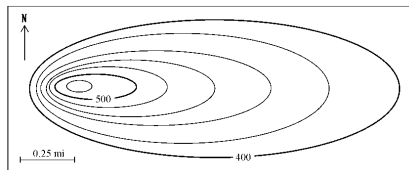
When is the steepest part of this terrain?



## Topographic Survey

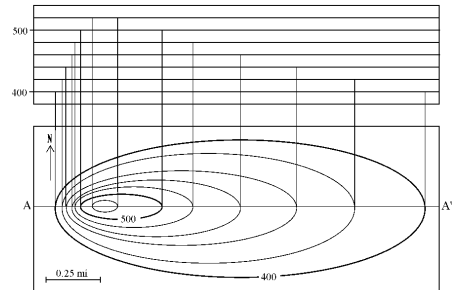
### Contours

What is the shallowest part?



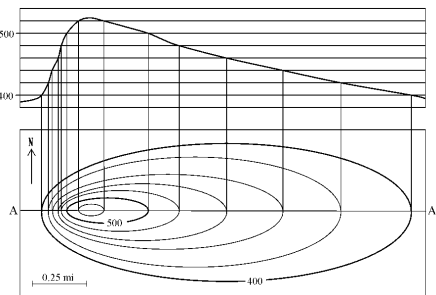
## Topographic Survey

### Contours



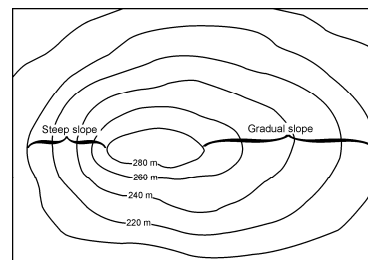
## Topographic Survey

### Contours



## Topographic Survey

### Contours



## Topographic Survey

### Contours

- The selection of the contour is important
- The contour interval should be small enough to give the desired topographic detail while remaining economic
- Usually every fifth contour line is shown in a heavy, wider line, this is called a ***index line***

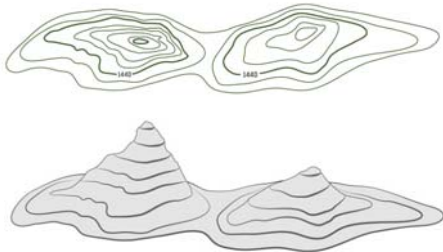
## Topographic Survey

### Contours



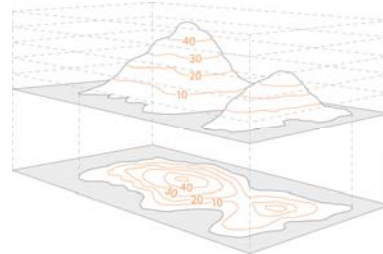
## Topographic Survey

### Contours



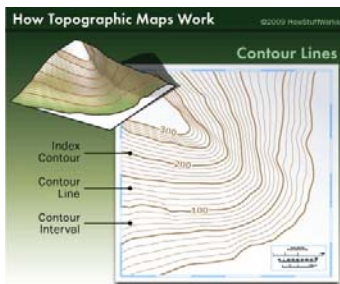
## Topographic Survey

### Contours



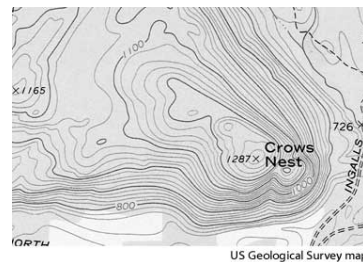
## Topographic Survey

### Contours



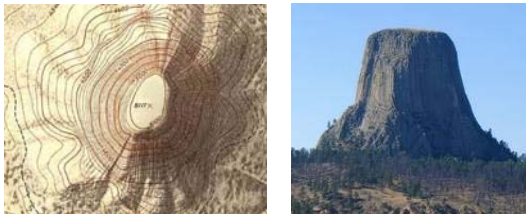
## Topographic Survey

### Contours



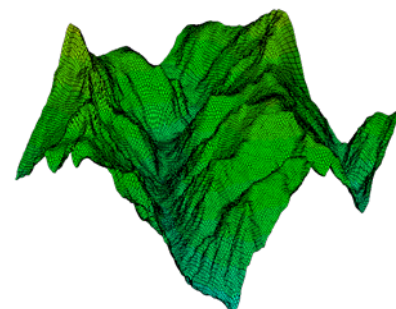
## Topographic Survey

### Contours



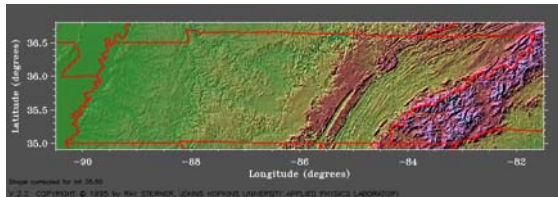
## Topographic Survey

### Contours



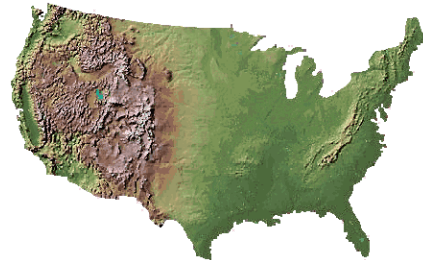
## Topographic Survey

### Contours



## Topographic Survey

### Contours



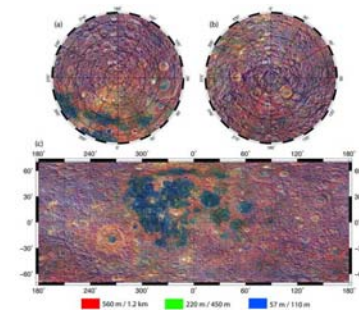
## Topographic Survey

### Contours



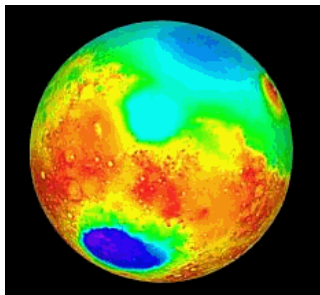
## Topographic Survey

### Contours



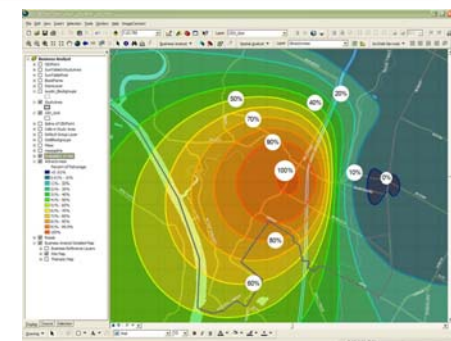
## Topographic Survey

### Contours



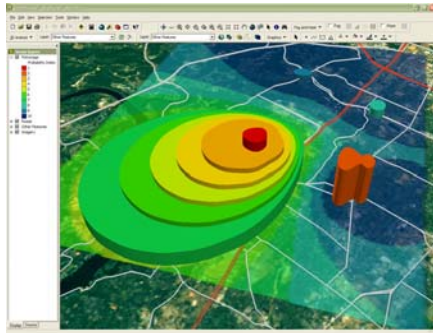
## Topographic Survey

### Contours



## Topographic Survey

### Contours



## Topographic Survey

### Characteristics of Contours

- Closely spaced contours indicate steep slopes
- Widely spaced contours indicate moderate slopes
- Contours should be labeled to the elevation value
- Contours are not shown going through buildings
- Contour lines do not cross

## Topographic Survey

### Characteristics of Contours

- Depression and hill look the same; note the contour value to distinguish the terrain
- Important points can be further defined by including a "spot" elevation
- Contour lines tend to parallel each other on uniform slopes

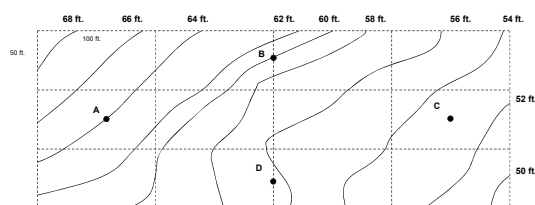
## Topographic Survey

### Construction of Contours

- The first step in developing a contour map is measuring the elevations of a group of points
- It will be easier for us to establish a rectangular grid of points (marked with flags) and measure the elevation
- The location of the flag points can be established by taping and checked by pacing or the odometer

## Topographic Survey

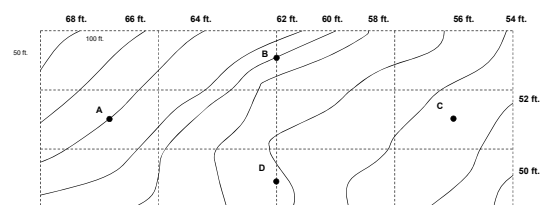
### Group Work



What is the elevation of point A?

## Topographic Survey

### Group Work

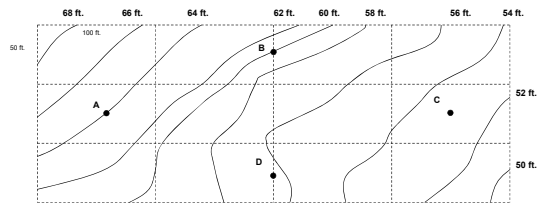


What is the elevation of point C?



## Topographic Survey

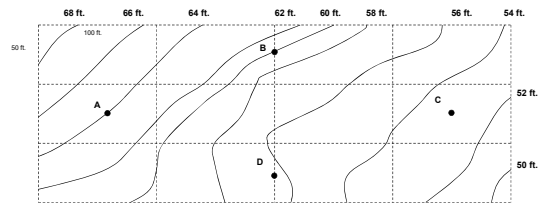
### Group Work



What is the approximate slope between points A and C?

## Topographic Survey

### Group Work



$$\text{slope} = \frac{\Delta \text{elevation}}{\text{length}} = \frac{53 \text{ ft.} - 64 \text{ ft.}}{300 \text{ ft.}} = -0.037 = -3.7\%$$

## Topographic Survey

End of Part 1