



Isolines

An isoline is a line connecting points of equal value.



Examples of isolines:

Isotherms:

points of equal temperature

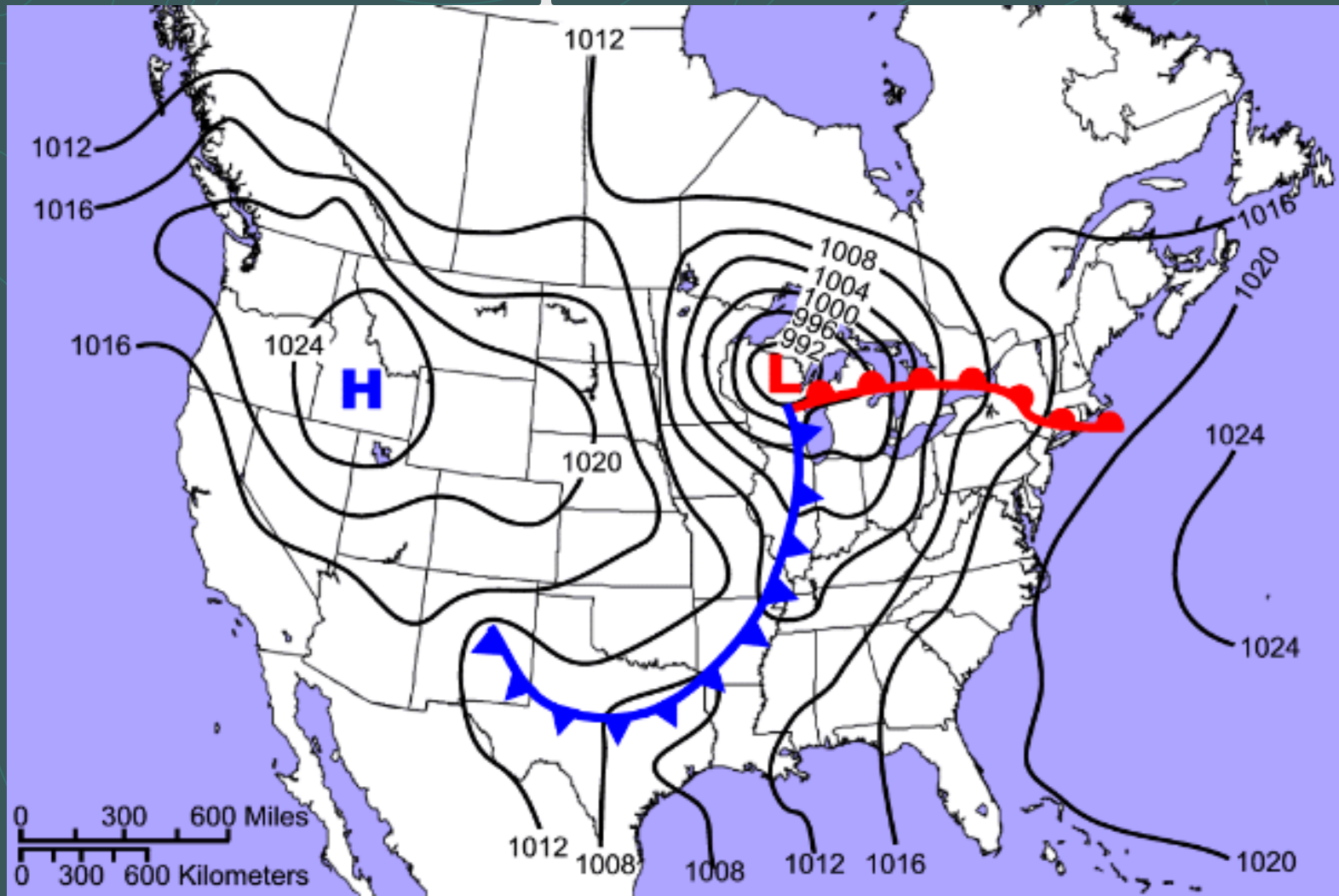
Isobars:

points of equal barometric (air)
pressure

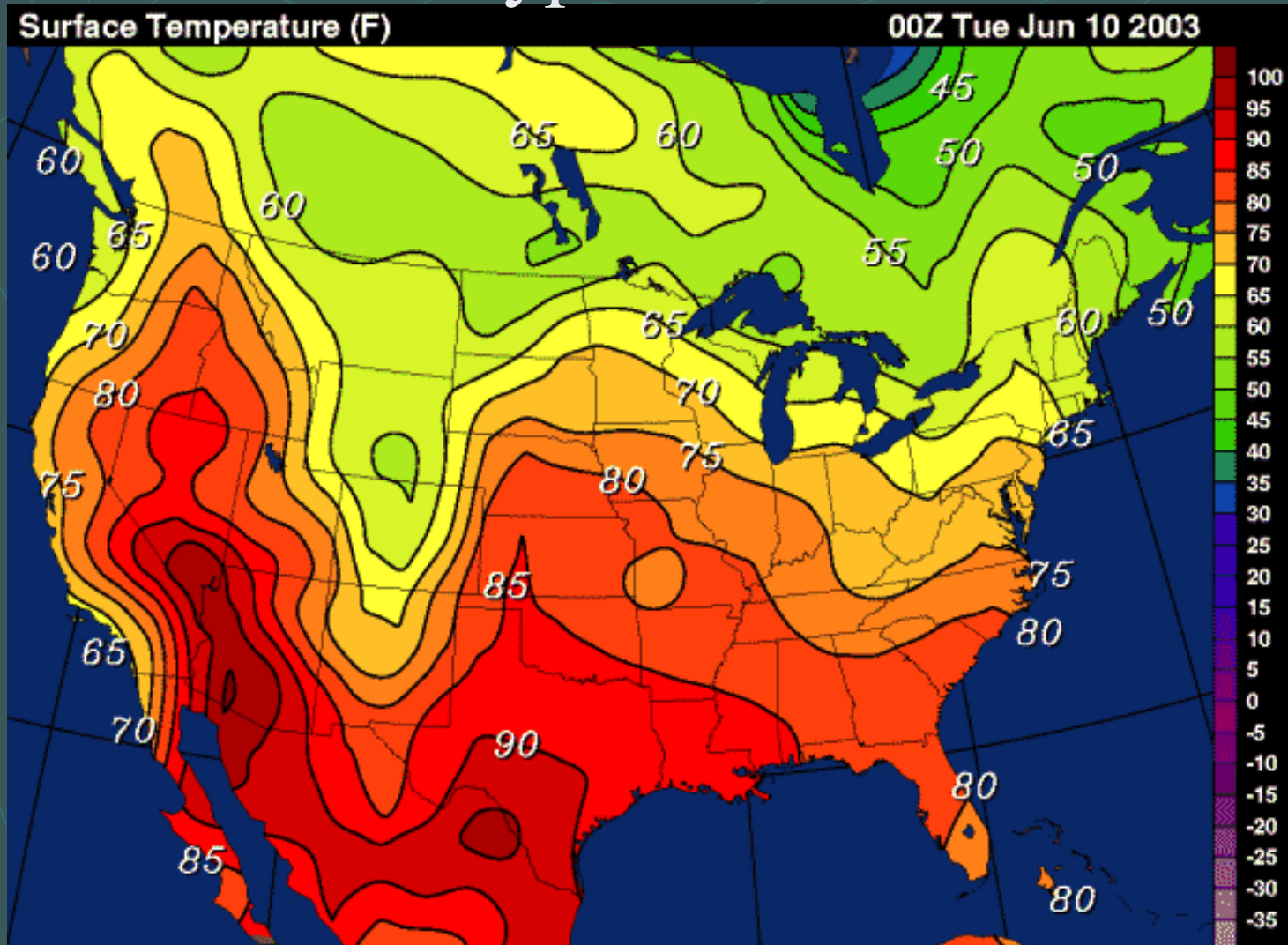
Contours:

points of equal altitude (elevation)

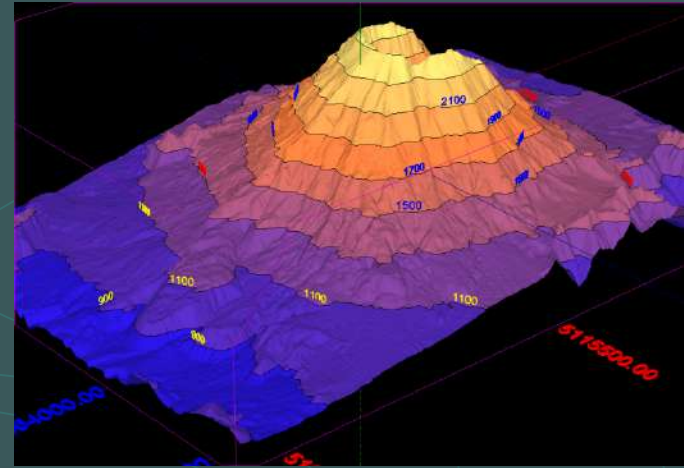
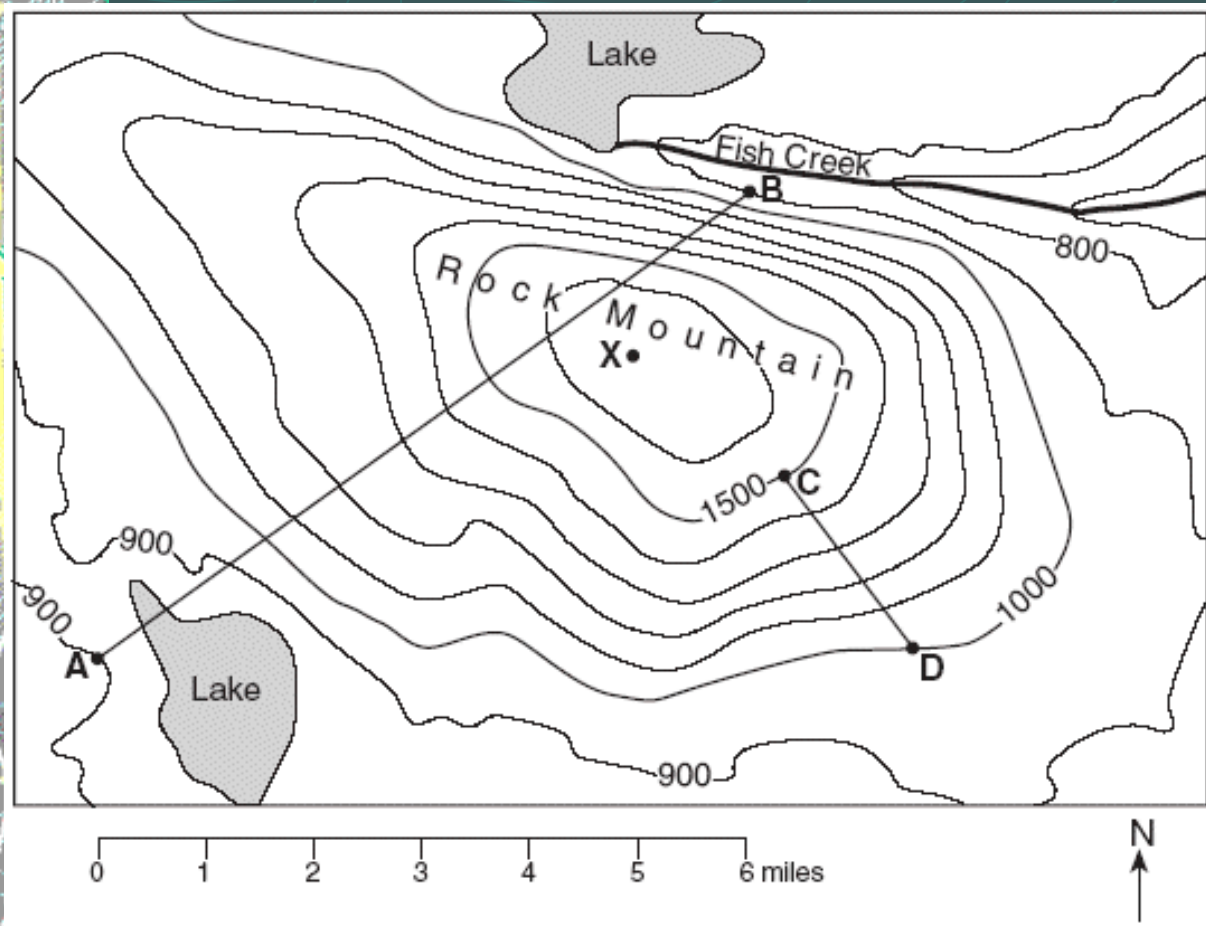
Isobars: Make concentric circles (rings) and show how air pressure changes from Low to High pressure



Isotherms: Show how temperature changes. Generally parallel but bend

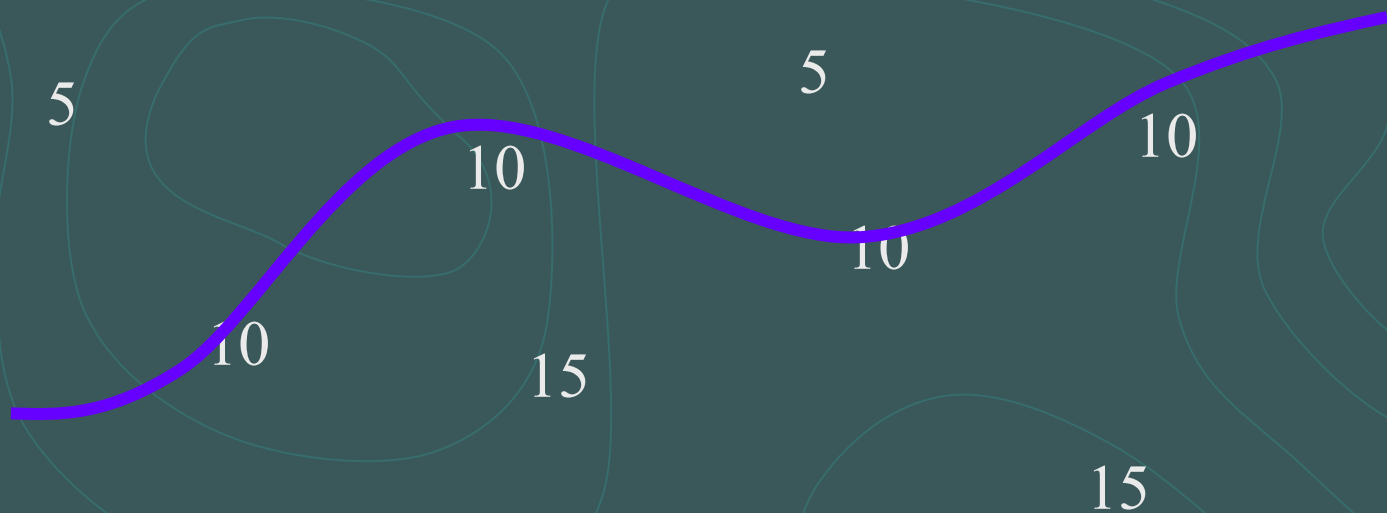


Contour Lines: show a change in elevation. They make parallel lines, AND concentric circles where the elevation increases

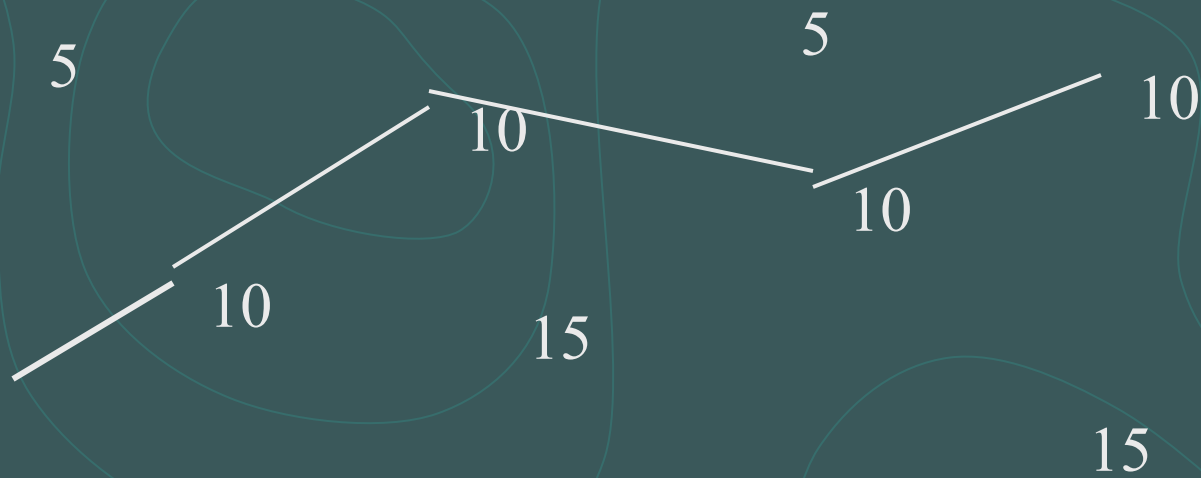


Rules for Drawing Isolines:

1. Isolines connect points of equal value.

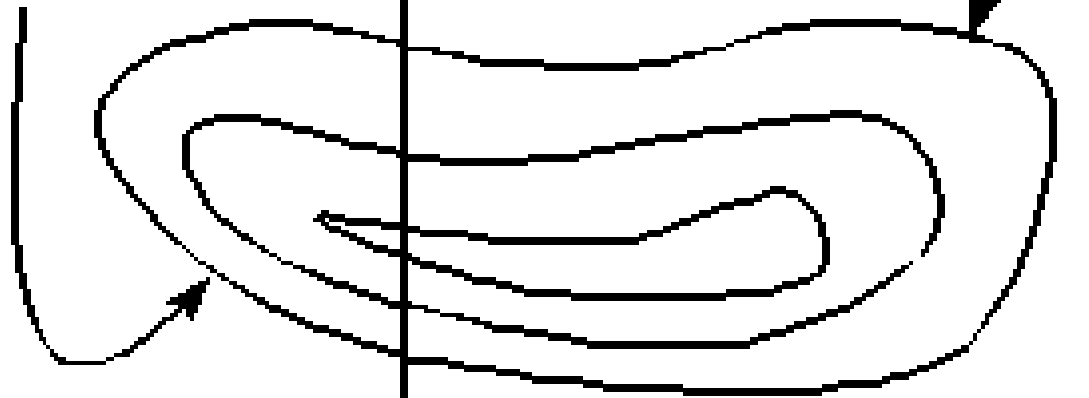


2. Isolines are gentle, curving lines- not sharp corners!.



3. Isolines are always closed curves even though the map might only show part of the overall picture.

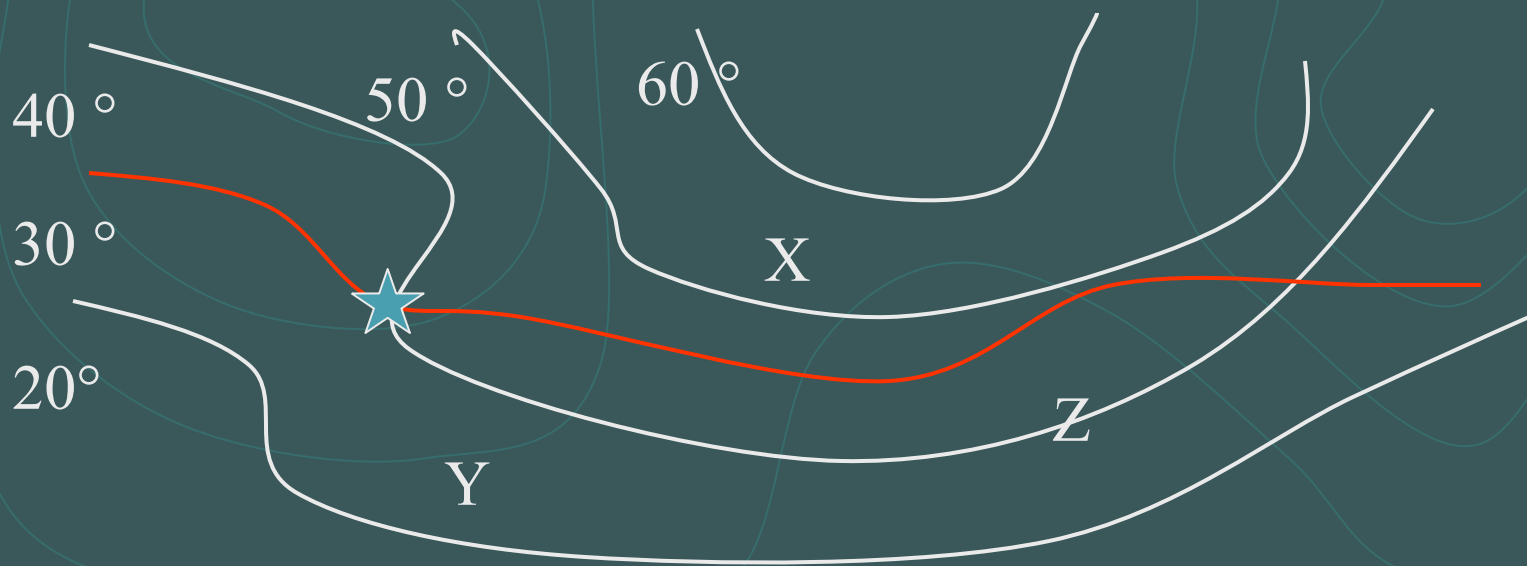
These lines
go off of
the page



Map outline

4. Isolines **NEVER** cross- this would mean that one point has two different values. Look Below

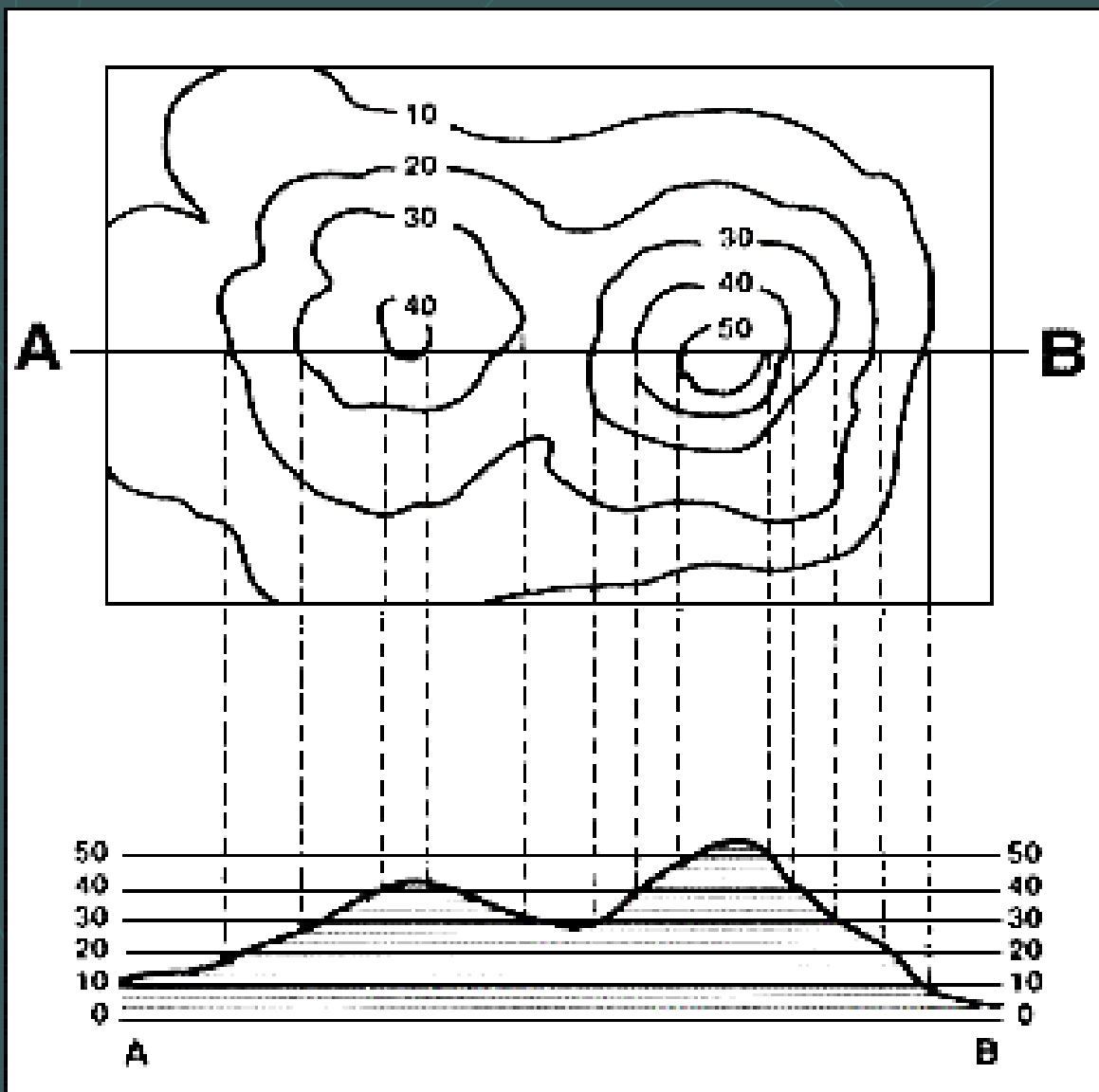
Ex: How can one spot have two different temperatures? ★



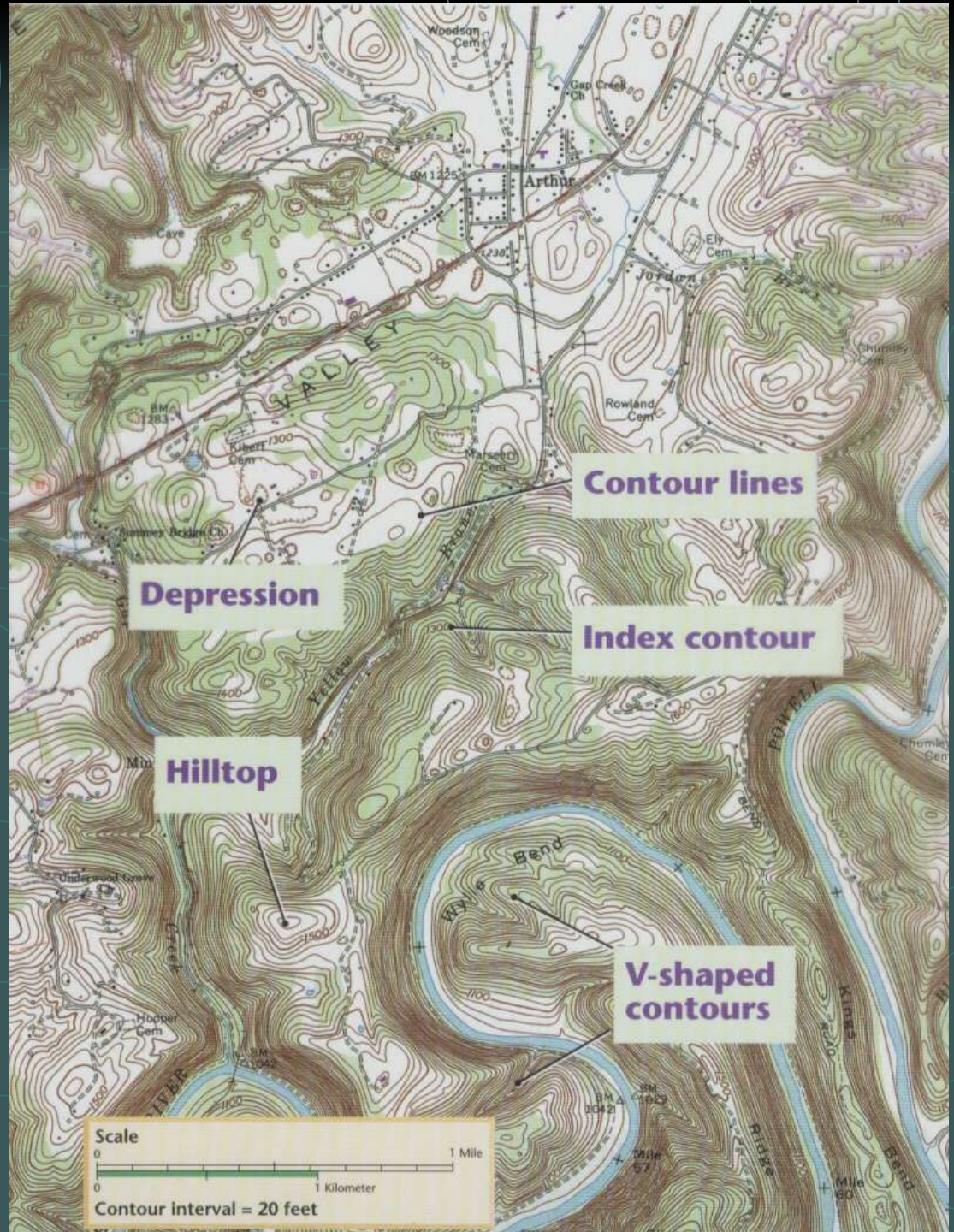
5. Isolines usually are parallel.
(They have a parallel trend/follow a continuous pattern)



We will be working with mostly contour lines throughout the mapping portion of the unit



This is a
contour
map! It has
LOTS of
elevation
contour
lines



A vertical strip on the left side of the slide shows a portion of a topographic map. It features brown contour lines, a blue stream, and a yellow profile line with cross-ticks. The background of the slide is a dark teal color with faint, light-colored contour lines.

Notes: Working with Isolines and Contour Maps

- 1.) Finding Gradient and Using a Map Scale
- 2.) Patterns/shapes that indicate types of landscape features
- 3.) Using contour lines to indicate stream/water flow direction
- 4.) Estimating elevation between contour lines
- 5.) Depressions and hachured contour lines
- 6.) Making a profile



Calculating Gradient on a map:

Gradient shows how quickly the value changes from one point to another. The change in value is either Temp, Pressure, or usually Elevation. The distance is found using a map scale and a scrap piece of paper.

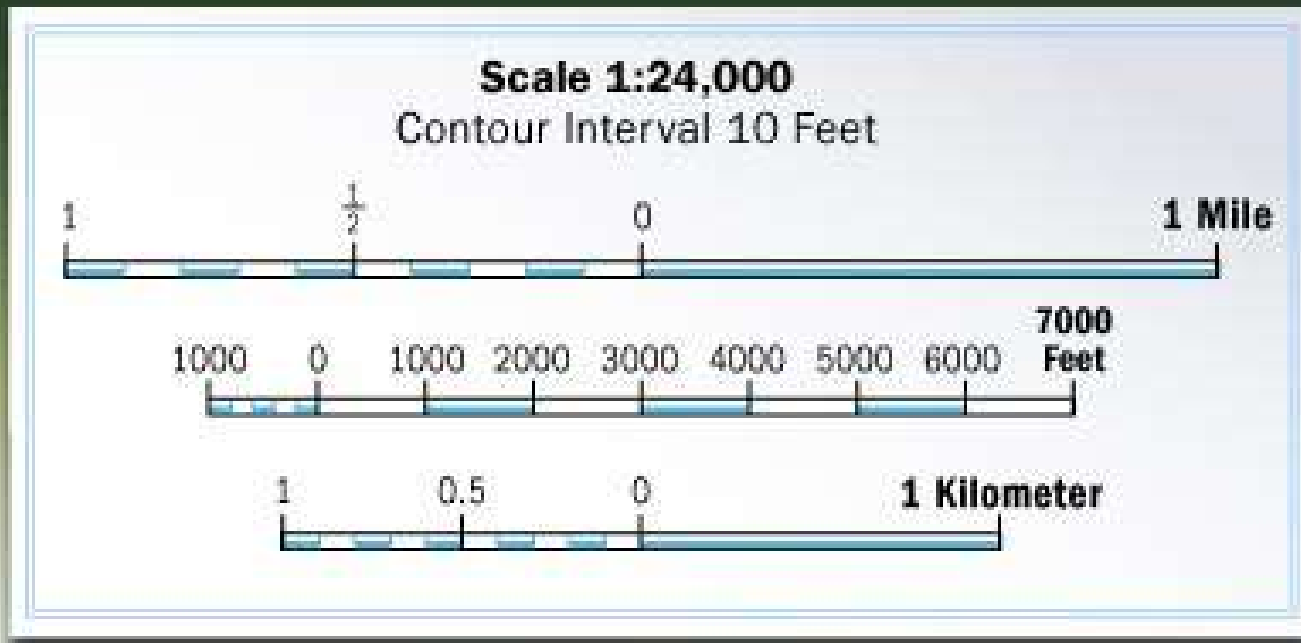
$$\textit{Gradient} = \frac{\Delta \textit{value}}{\textit{distance}}$$

Map Scales

On every map, the measured value on the map must equal a real life distance to scale

How Topographic Maps Work

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Example Scale

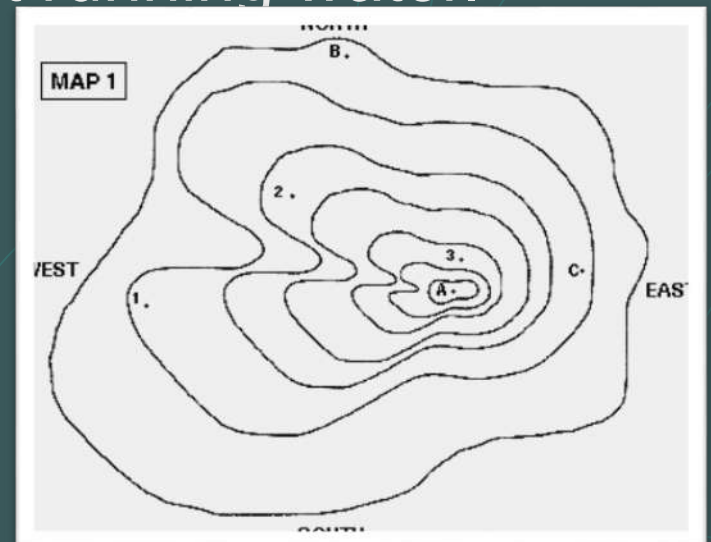
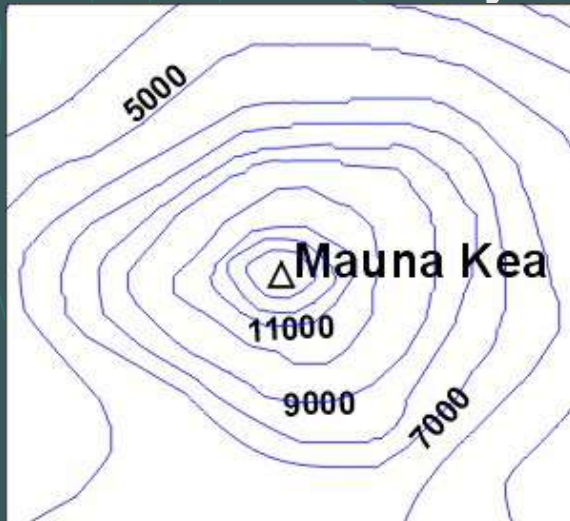
1 inch = 24,000 inches (2000 ft)

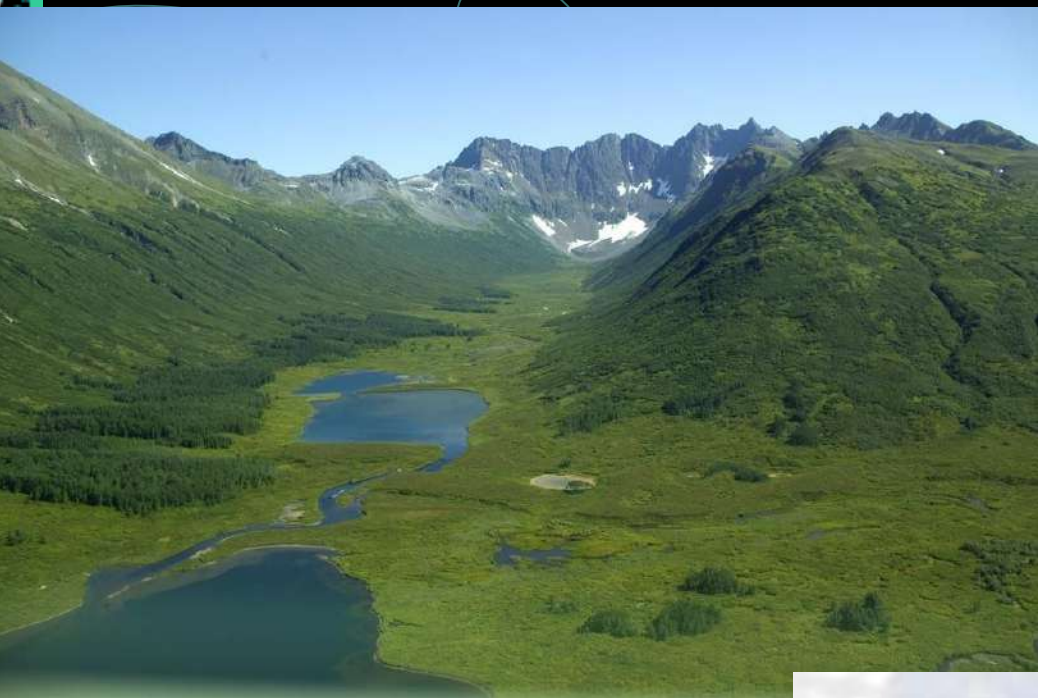
Part II: Reading Contour Maps

Contour maps show how elevation changes. There are a few patterns to help understand what is going on:

1.) Concentric circles= indicate a hill, mountain, peak where the elevation increases.

2.) When lines make a “V” or “U” shape, that indicates there is a valley- with or without running water.





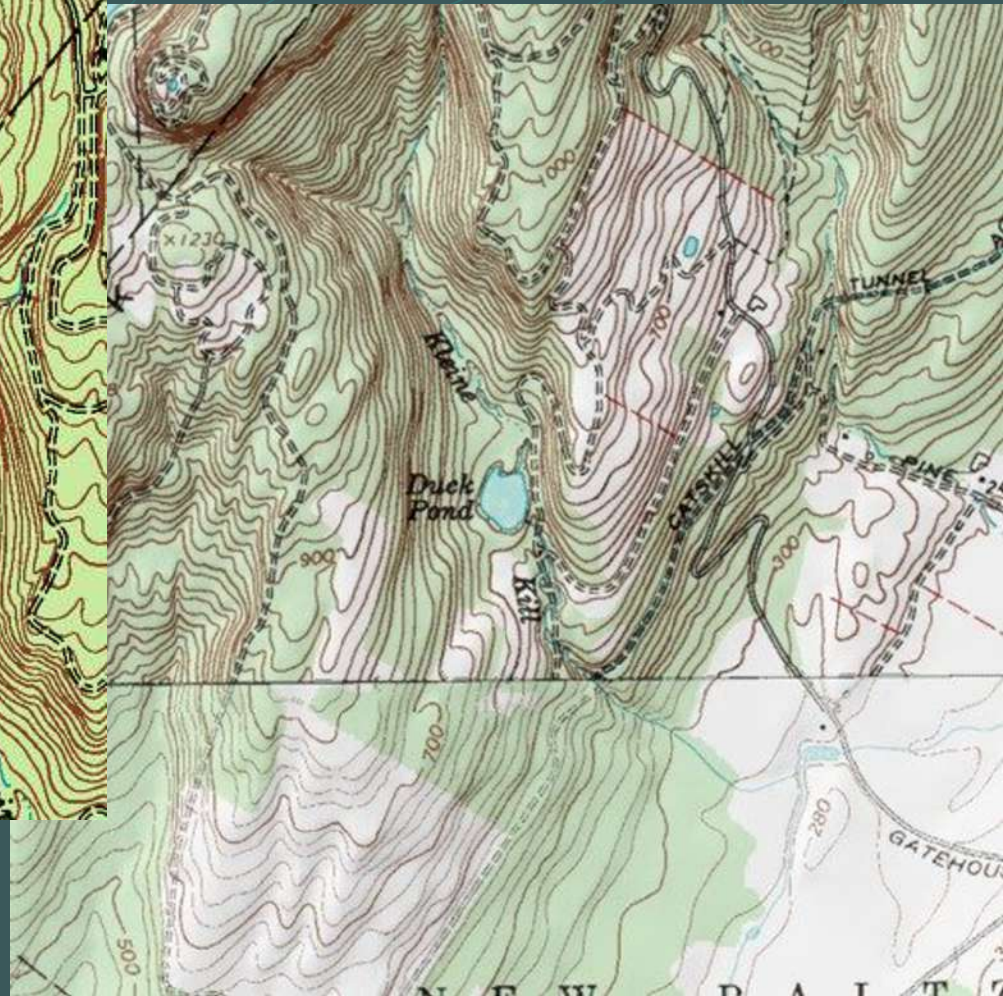
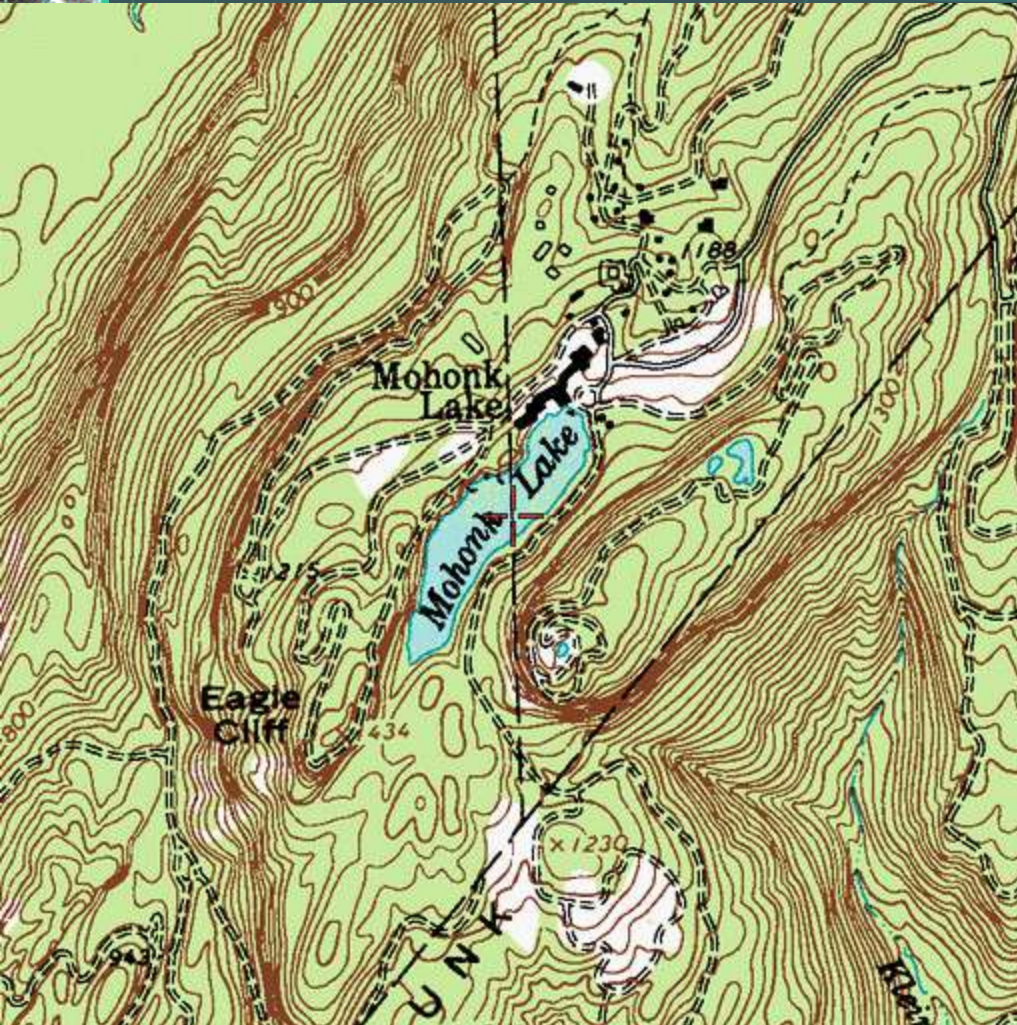
← U- shaped valley



V- Shaped Valley



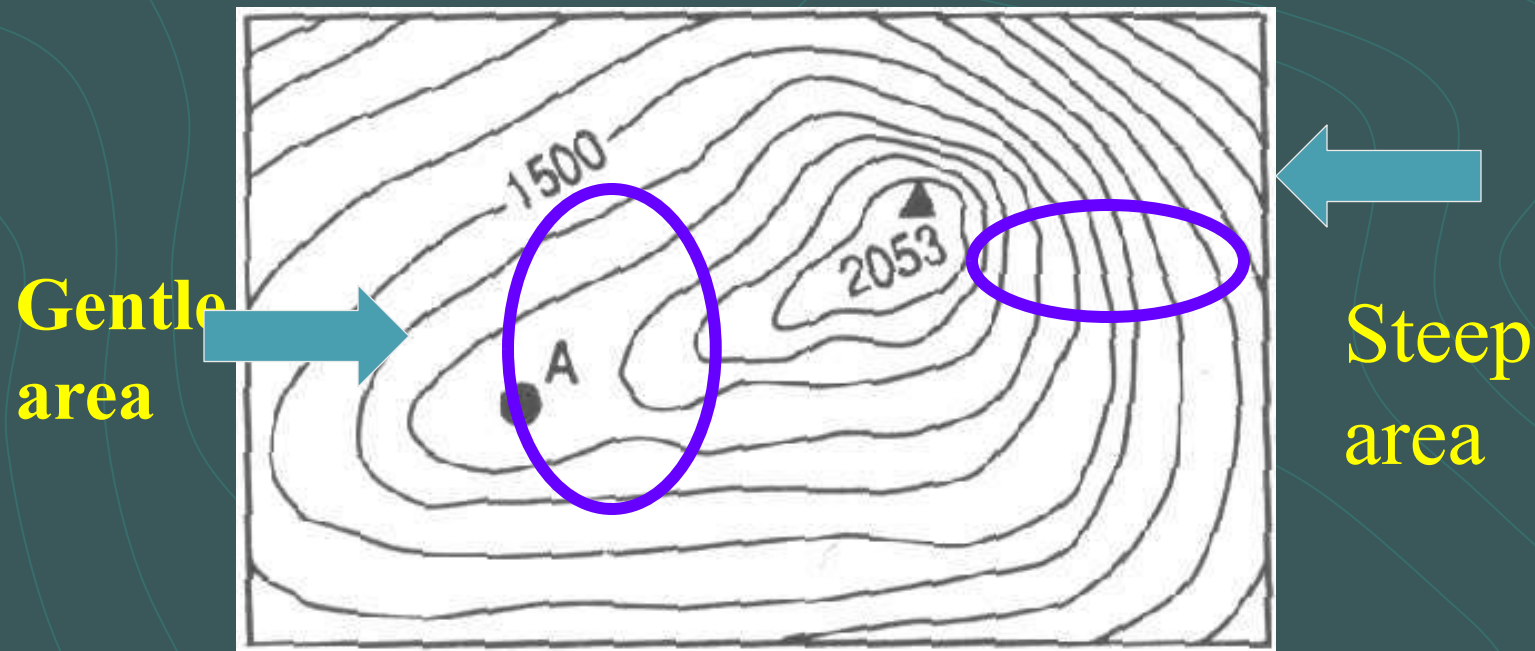
Contour Line's show topography



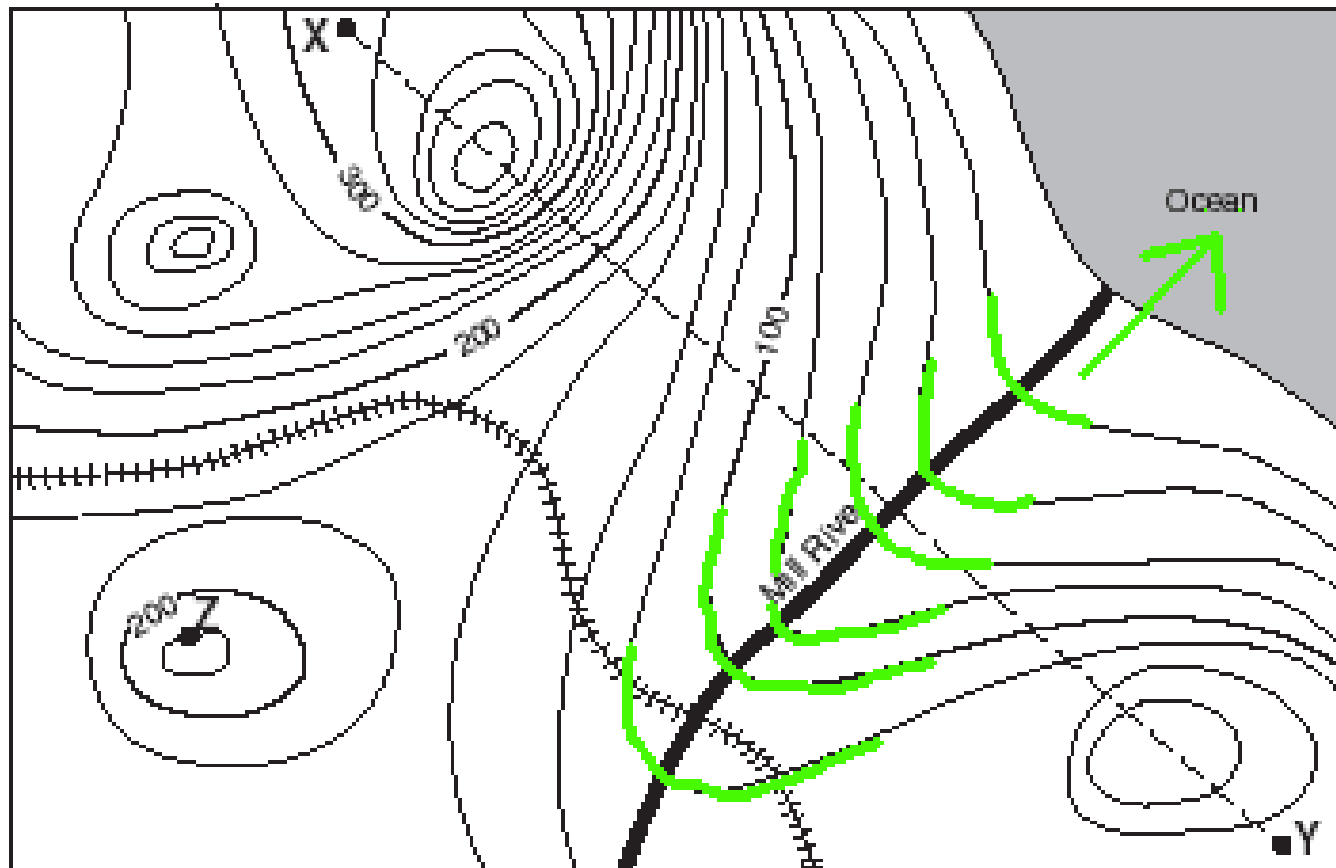
Gradient in relationship to the spacing of contours:

A **steep (high)** gradient changes quickly and the isolines are close together.

A **gentle (low)** gradient changes slowly and the lines are far apart.



How do contour lines show stream flow?
Contour lines bend and make a “v” that points upslope in the OPPOSITE direction water flows



Contour interval = 20 meters

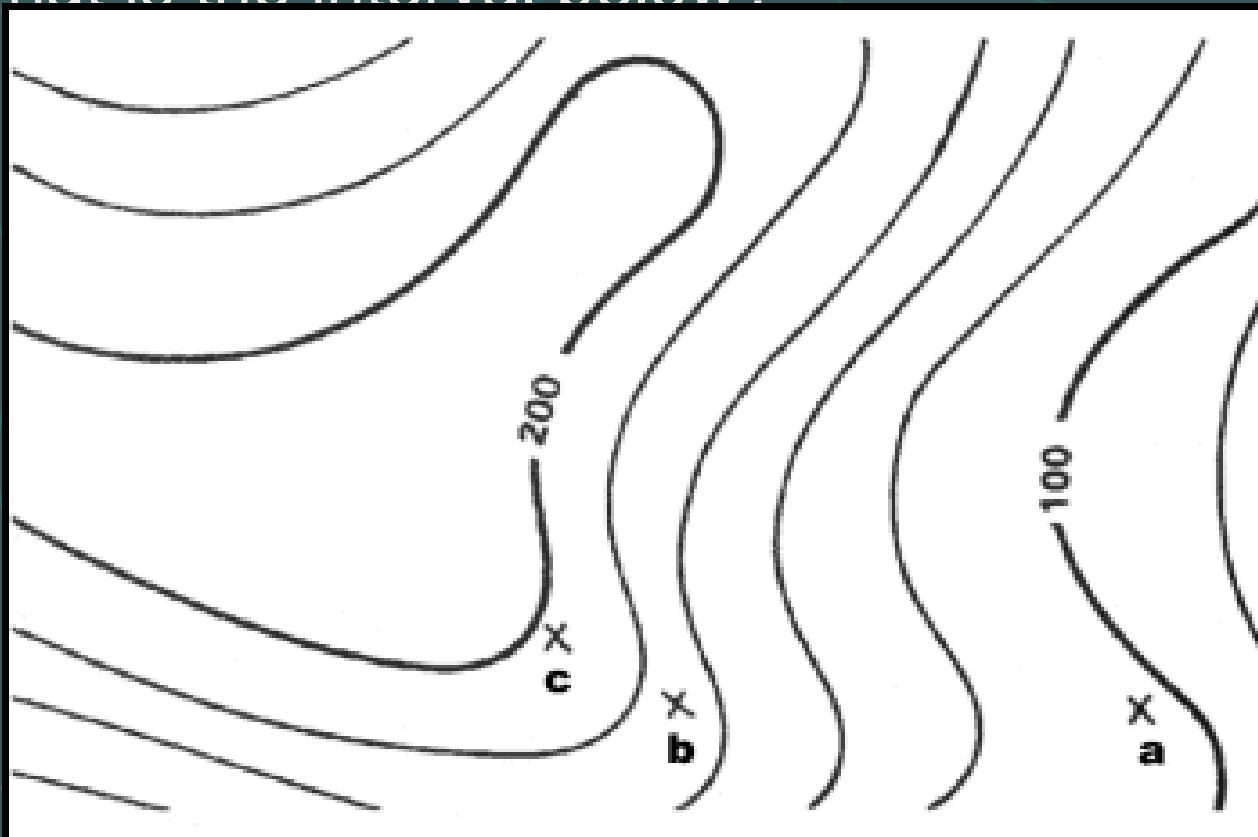
N
▲

Some Basics about Contour Lines:

Contour Interval = The difference in elevation between consecutive but different value contour lines

Sometimes it's not listed...you have to count!

What is the interval below?



What are the values for both c, b, and a?

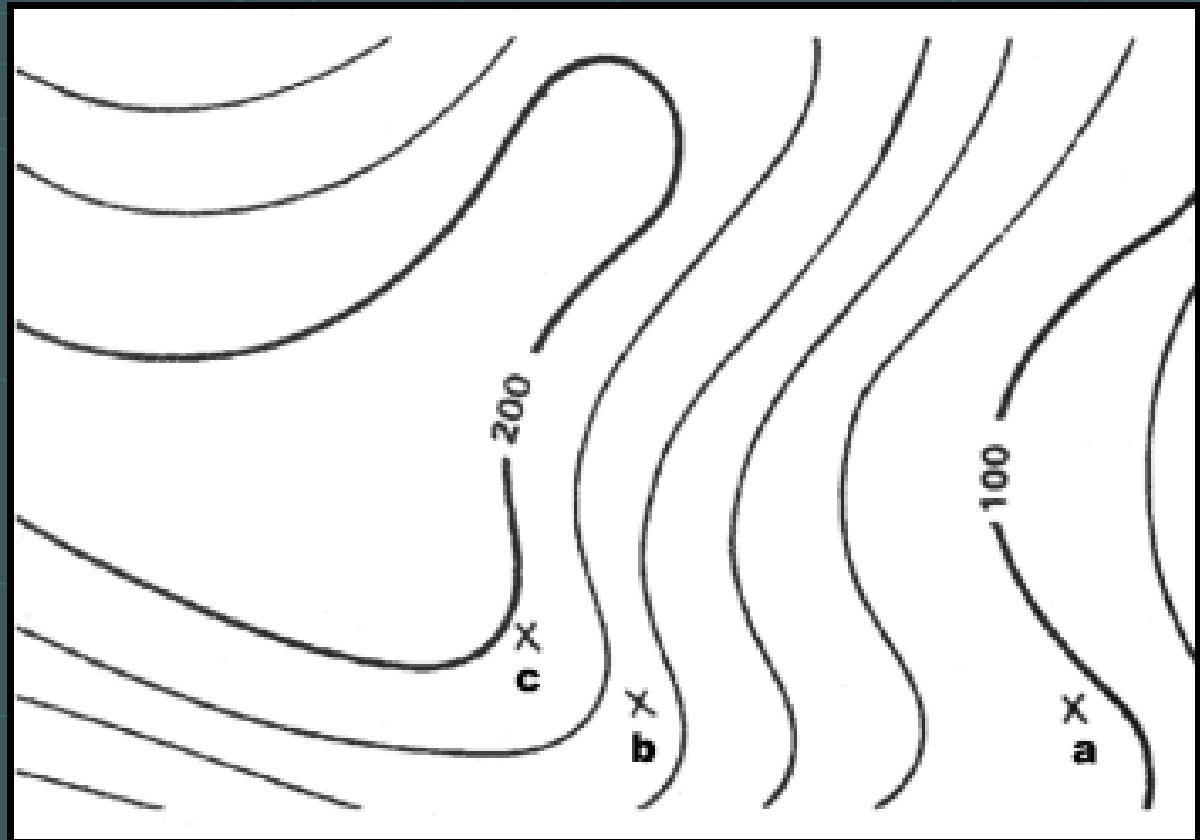
Estimating Elevation not marked:

Any point marked on a map that does not lie directly on a contour line can be estimated to be the average elevation between two contour lines

C = 190'

B = 170'

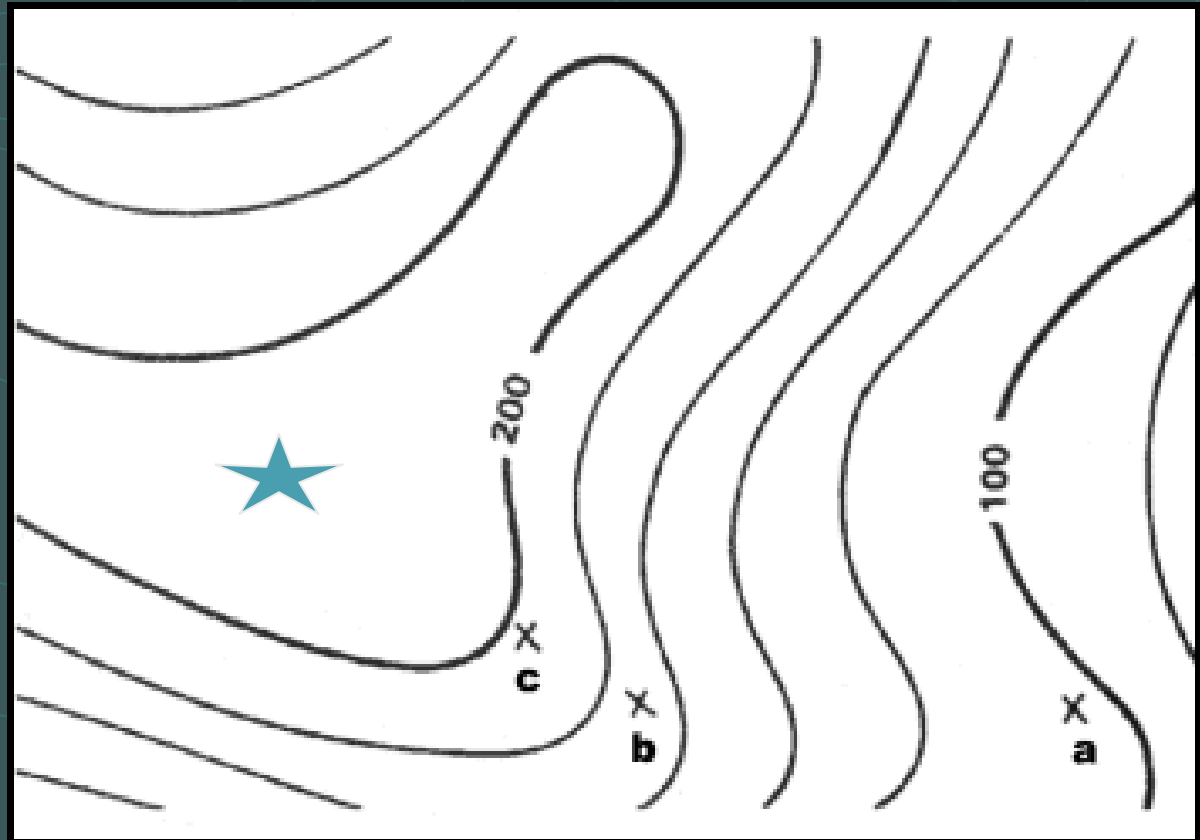
A = 110'



Max and Min Elevations

The MAX elevation something can be without being directly on a contour line is the MAX value within that interval

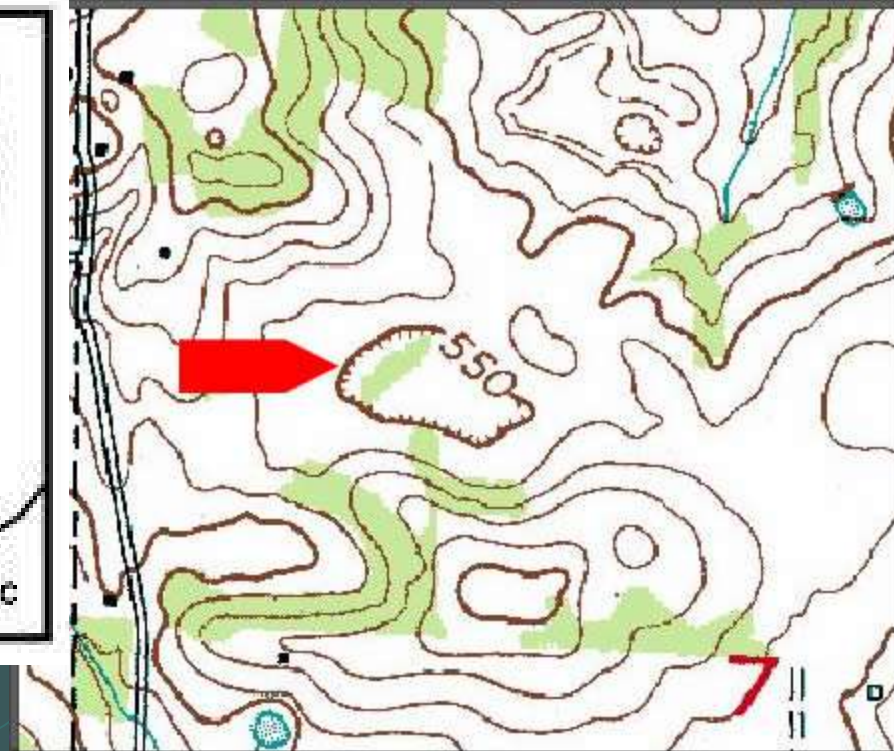
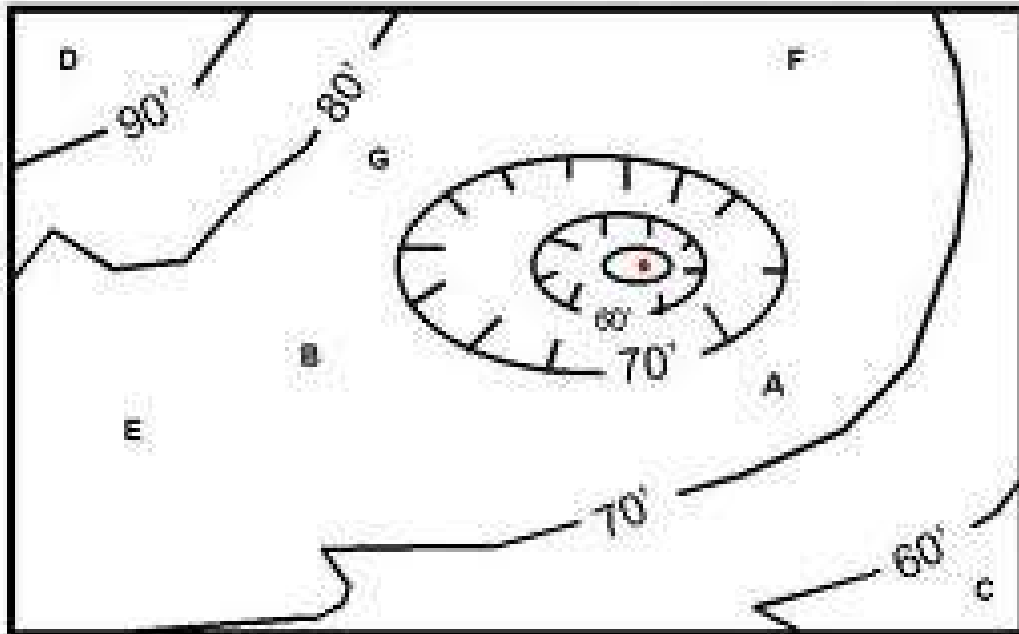
What is the max and min value for the star?



Contour Depression lines/ “Sinkholes”

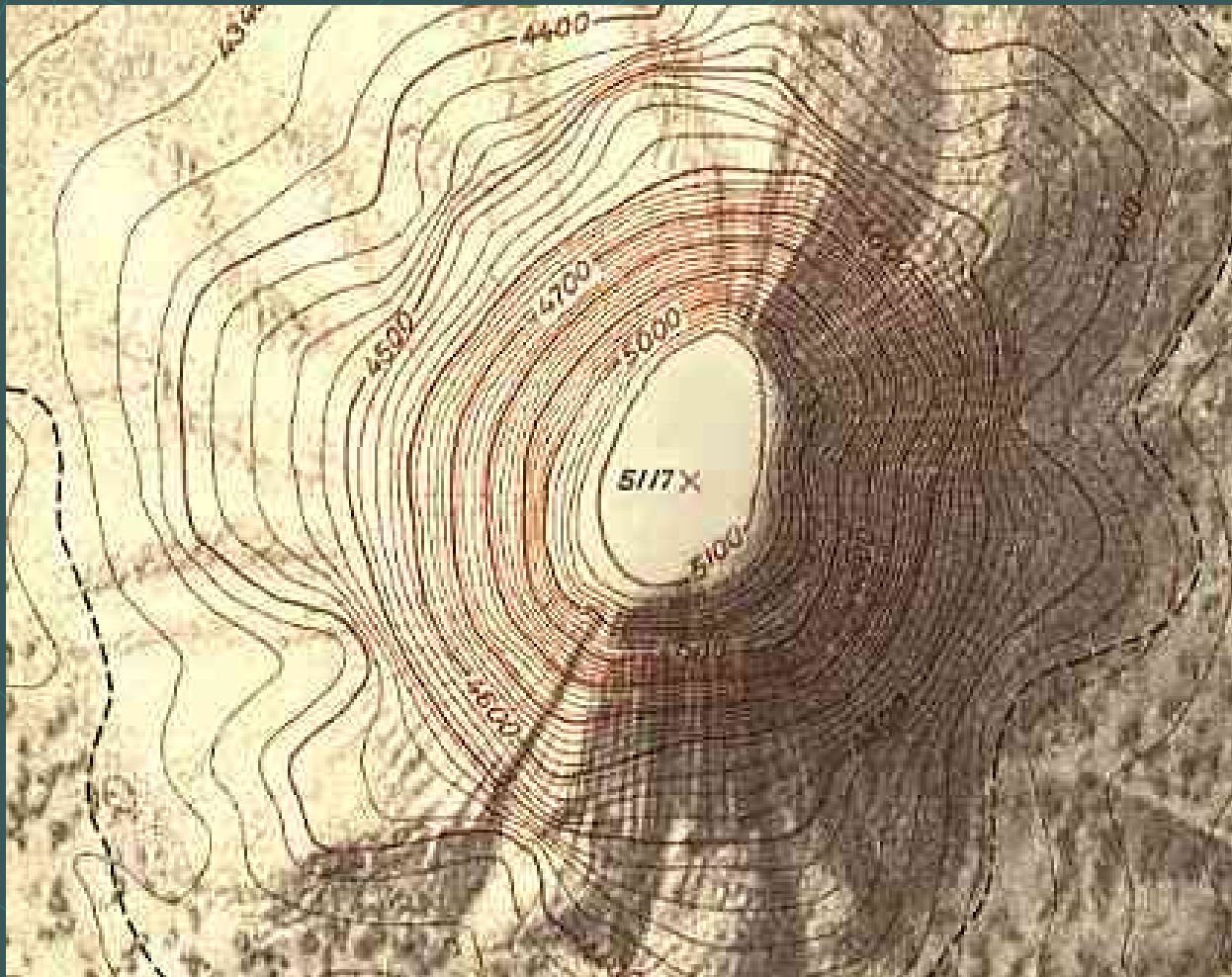
The first depression contour will have the same value as the previous contour line; after that it ↓ by the same contour interval backwards

N ↑ contour interval = 10'



Benchmarks

“BM or X” = marks EXACT elevation. X=where the metal marker on the ground is.



A vertical strip on the left side of the slide shows a portion of a topographic map. It features brown contour lines representing elevation, a blue line for a river or stream, and a yellow line indicating a specific profile line. The background of the slide is a dark teal color with faint, light blue contour lines.

TOPOGRAPHIC PROFILES

TOPOGRAPHIC MAPS SHOW THE ELEVATION OR VERTICAL DISTANCE ABOVE SEA LEVEL OF THE SURFACE OF THE EARTH

TOPOGRAPHIC PROFILE IS A SIDE VIEW OF AN AREA.

How to make a topographic profile

York Town Regional Topographic Map


Map Legend:

Contour Line	Marsh	Road
Index Contour	Buildings	

Elevations in Meters

Scale 0

C. What is the contour interval on the map above? _____

D. What does this symbol mean?  _____

E. Use the grid below to construct a profile along line W-E on the topograph

Elevation in Meters

150


100

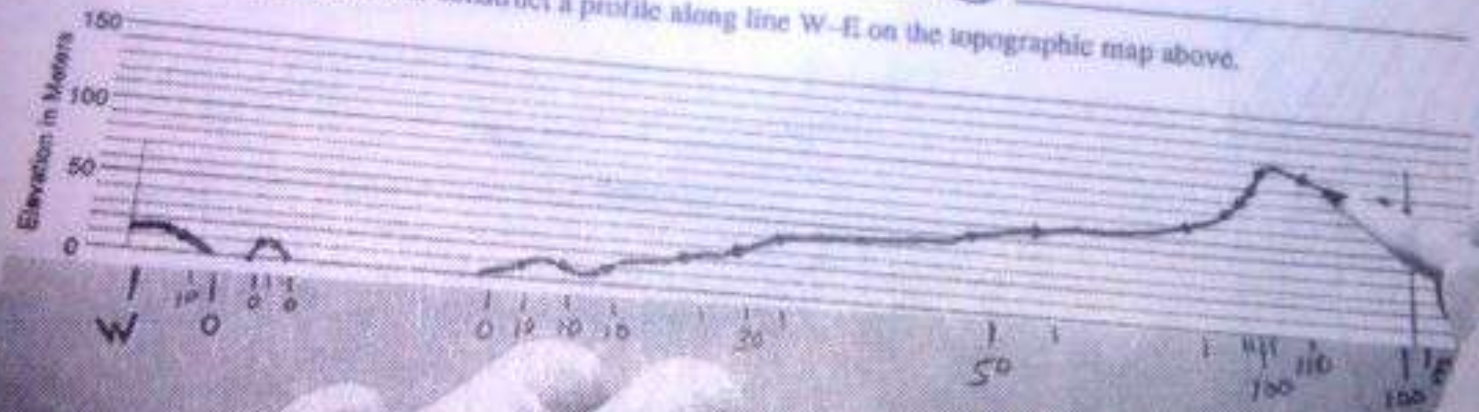
50



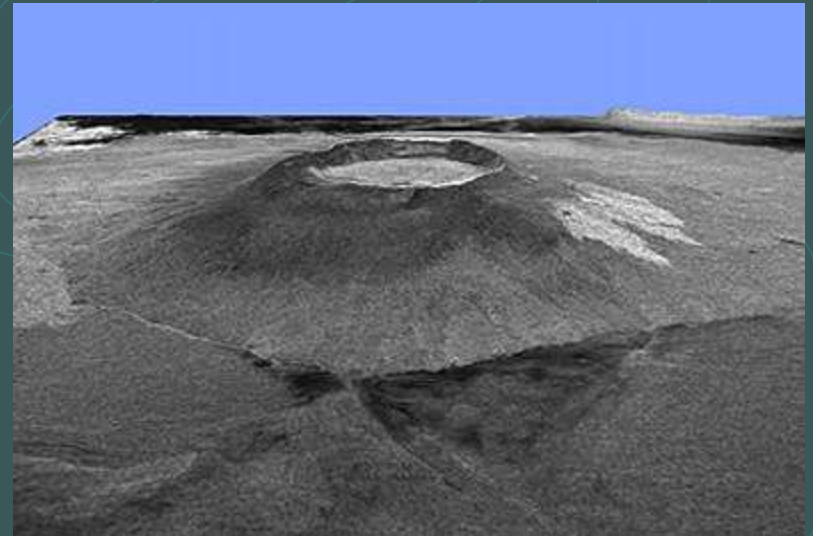
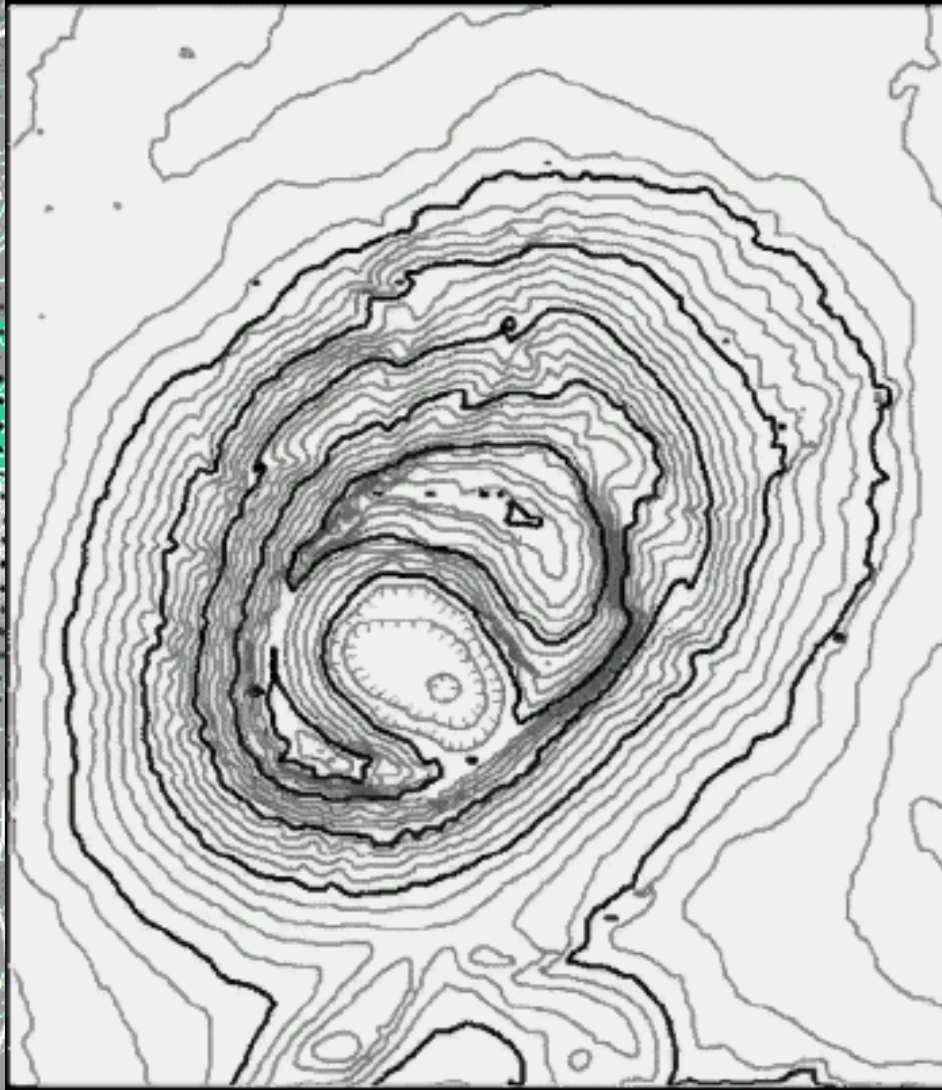
Map Legend: Contour Line ———
 Index Contour ———
 Elevation in Meters ———
 Marsh ———
 Road ———
 Buildings * * *



- C. What is the contour interval on the map above? _____
- D. What does this symbol mean?  _____
- E. Use the grid below to construct a profile along line W-E on the topographic map above.

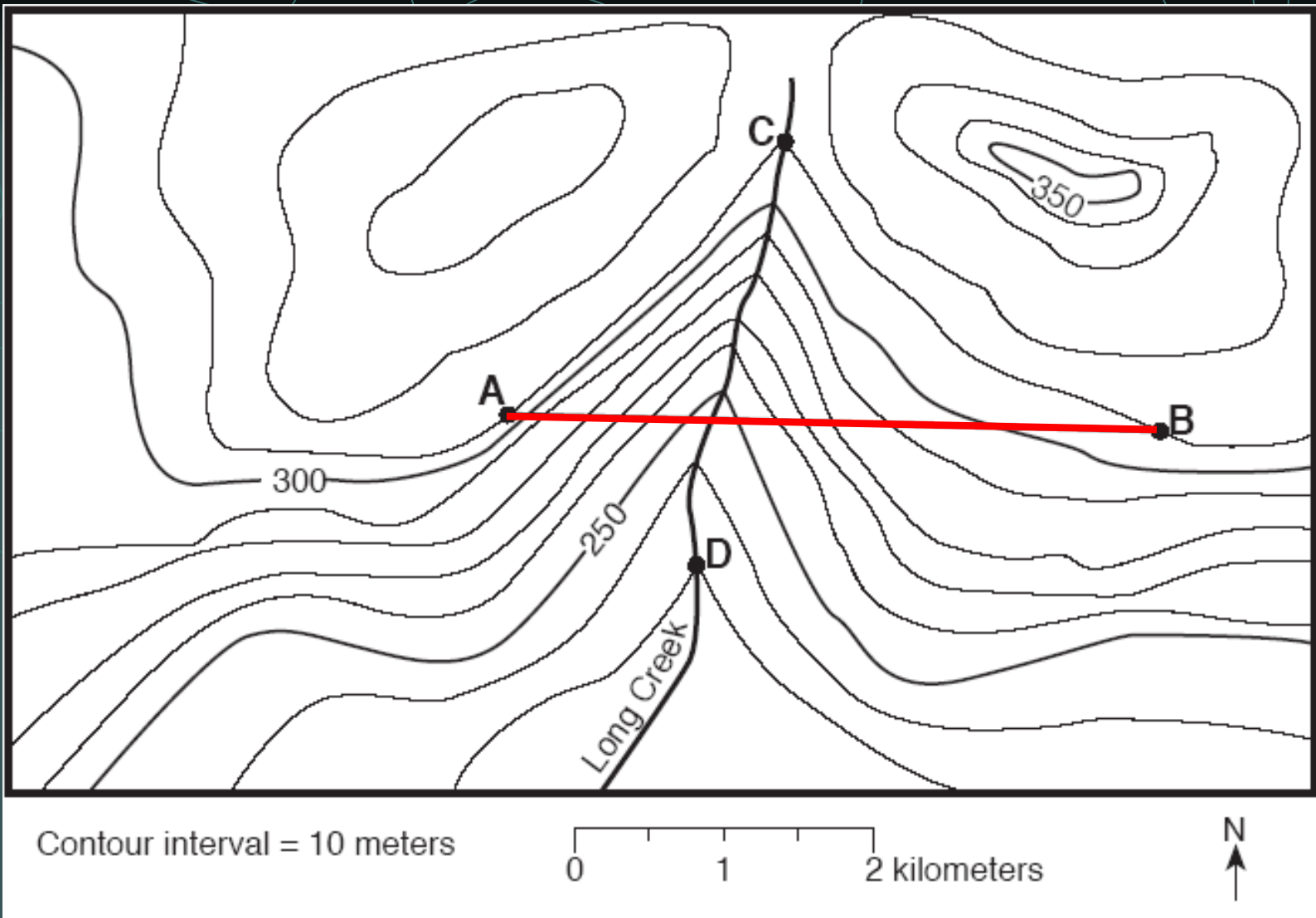


WHAT DOES THIS PROFILE SHOW?



VOLCANO

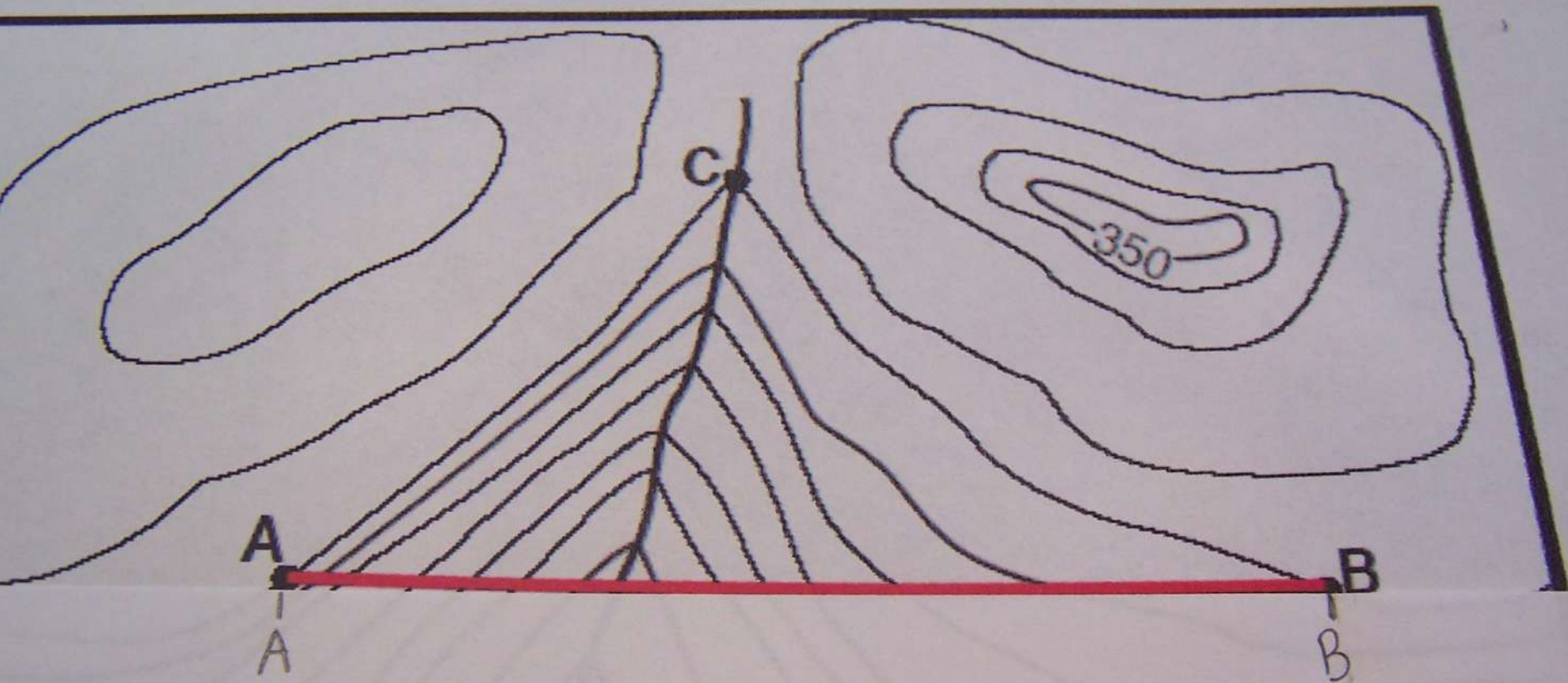
NOTICE HACHURE
DEPRESSION LINES IN
CENTER SHOWING
VOLCANIC VENT



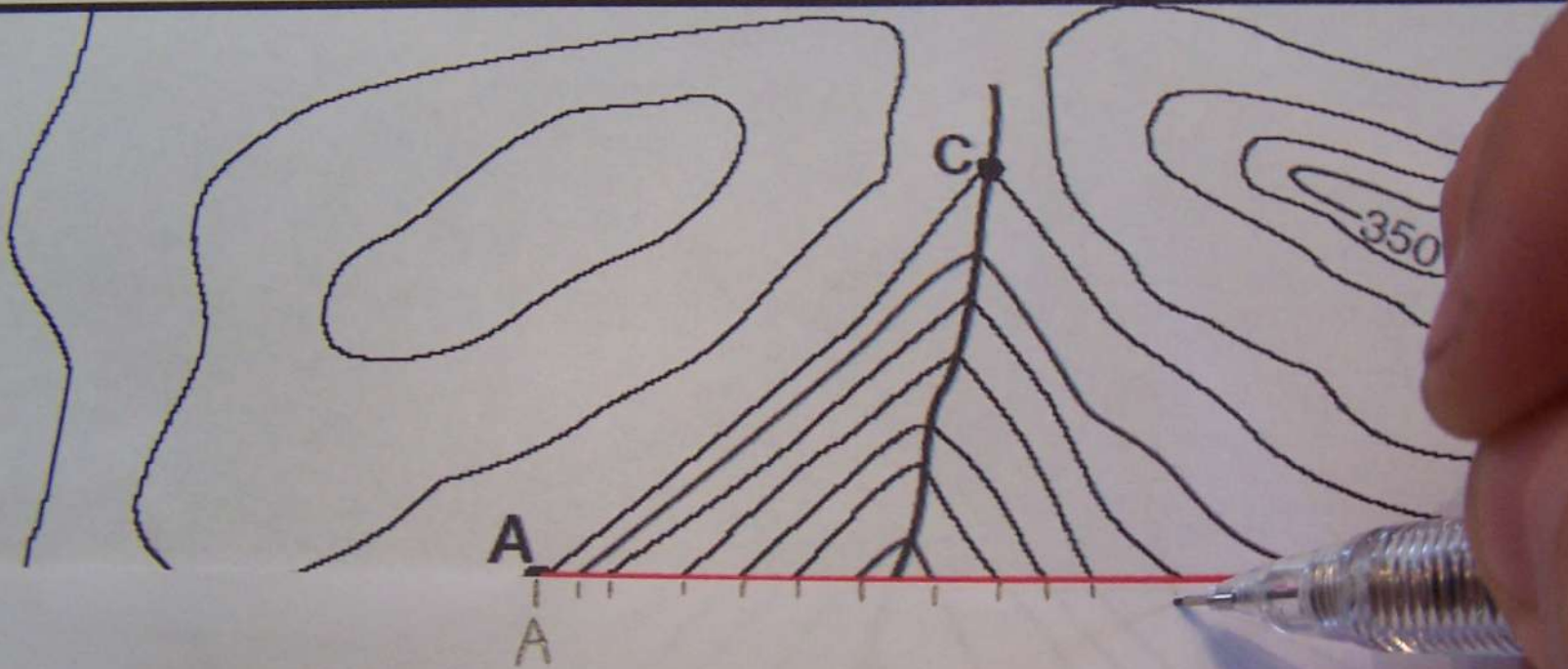
For Profile A-B:

Take out a piece of scrap paper and mark where A-B extends

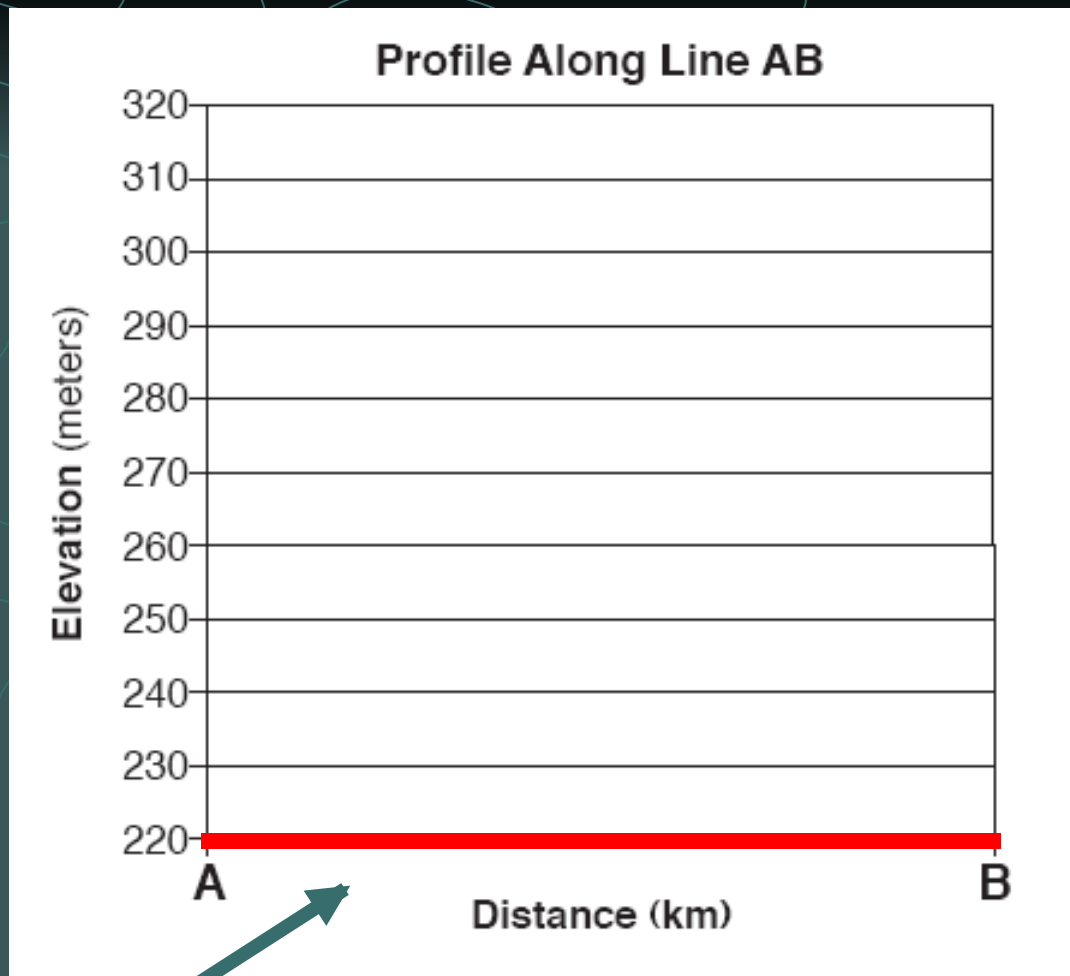
Introduction to topographic profiling



Introduction to topographic profiling



Place a tick mark where every contour line intersects your piece of paper along A-B!



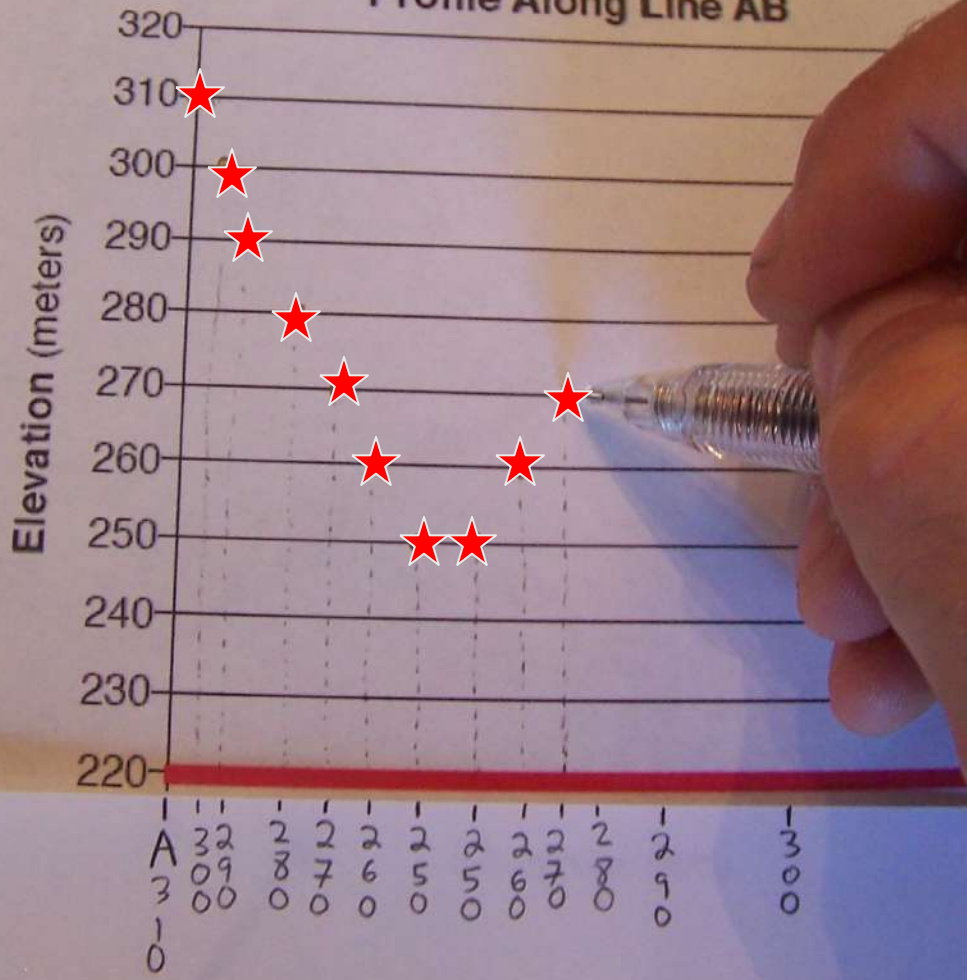
Hold your scrap paper page up to the profile.

Continue to plot all points, then connect all points with a smooth curve!

Name: _____

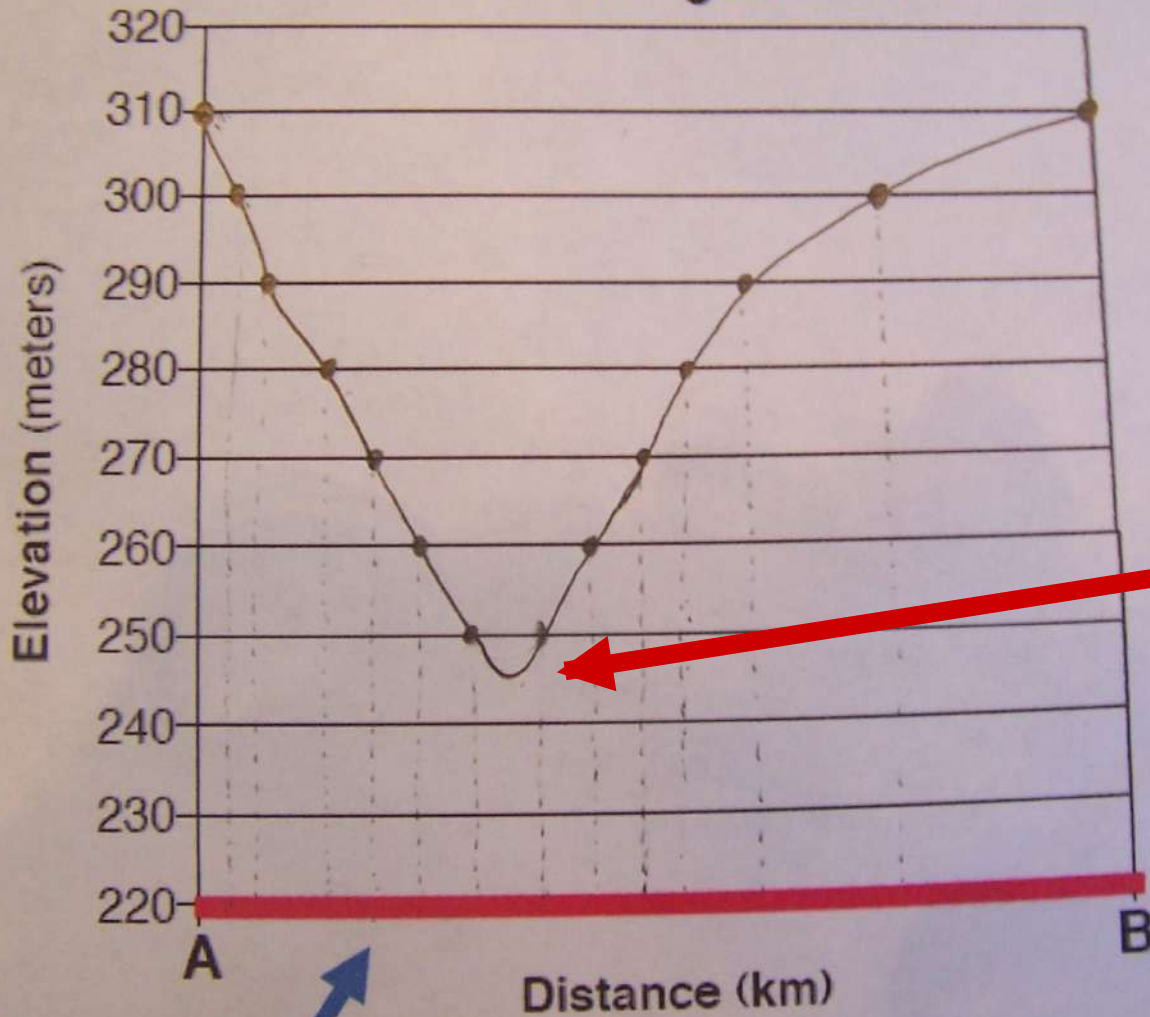
Introduction to topographic profiling

Profile Along Line AB



Introduction to topographic profiling

Profile Along Line AB



This is what you might expect the "profile" or cross section view of line AB to look like!

Notice how the line dips below 250m where it crosses Long Creek