

## LAB EXERCISE 13 - ISOPLETHS & CONTOUR LINES

Name:	Course ID:
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Isopleths are lines that connect places on a map to which the same numerical value of some measurement applies (examples: elevation, pressure, temperature). Such lines separate higher values from lower values. The spacing between the lines tells us how fast the quantity is changing with distance. This change of a quantity with distance is called a **gradient**. Often it is necessary to interpolate (estimate) the position of an isopleth from the surrounding area.



[“HOW TO”  
Video Lecture  
\(click here\)](#)

How to: In order to draw isopleths USE A PENCIL!!!!

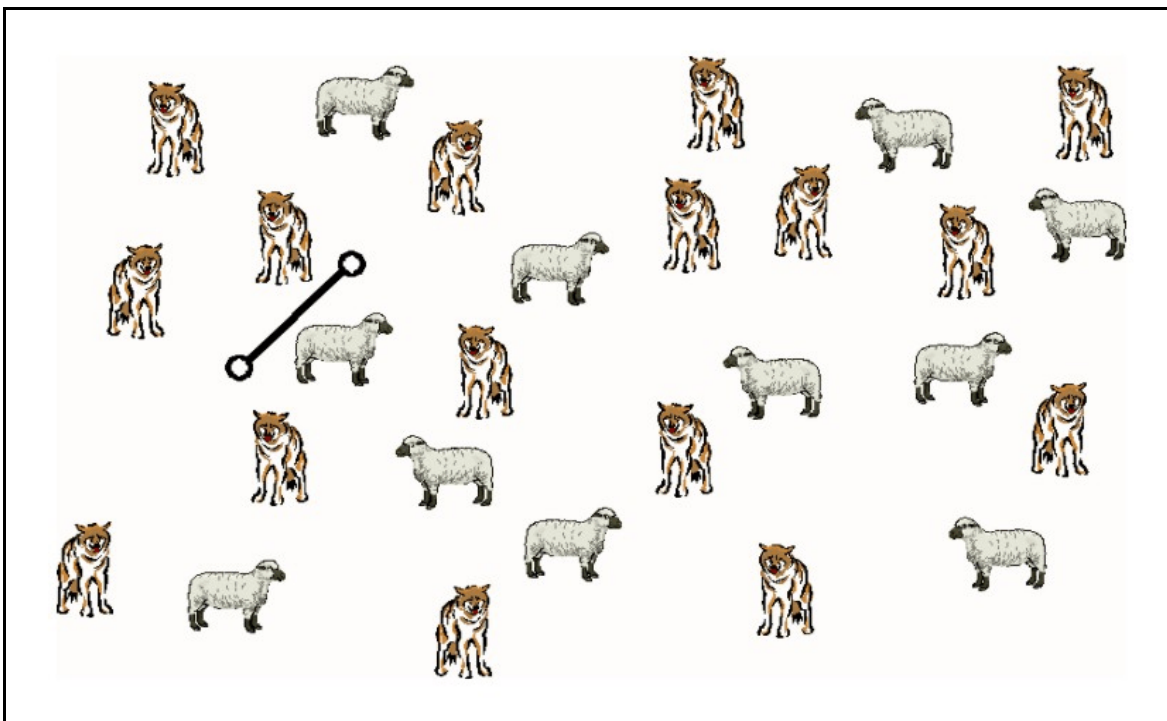
1. Scan the data to locate regions of maximum and minimum values and get an overall view of the distribution.
2. Begin with an intermediate value. Draw the first isopleth lightly preferably the one that has the most available data.
3. Lightly draw the remaining isopleths. They will follow usually the general outline of your first isopleth.
4. Do NOT draw isopleths in regions where there is no data. Every isopleth should have at least one value on each side of it.
5. Isopleths NEVER branch, merge, split, or intersect.

### EXERCISE 1

Objectives: **1<sup>ST</sup> FUNCTION OF AN ISOPLETH LINE - SEPARATE DIFFERENT VALUES**

**Isopleth Rule: If possible, an isopleth should make a closed loop without touching or crossing**

Draw a “fence” line that separates all the wolfs from the sheep. The sheep should be on one side of the line and the wolfs on the other side. Your “fence” line should form a closed loop.



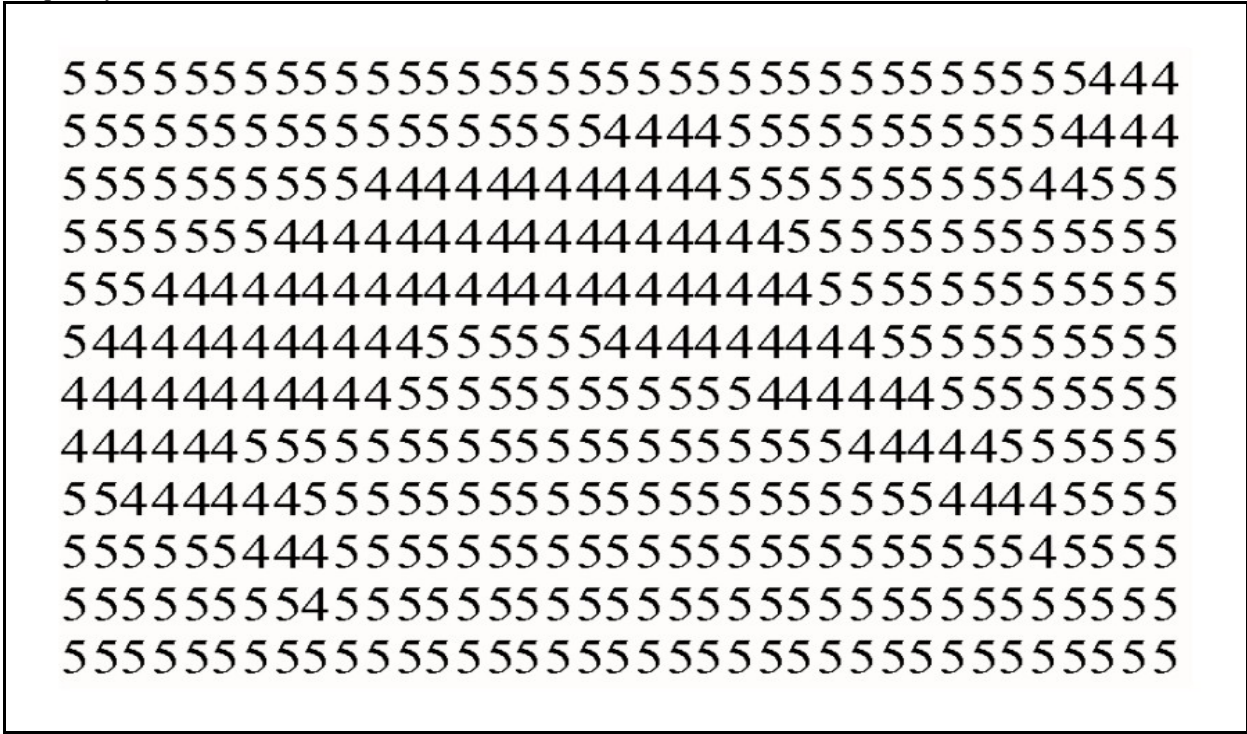
EXERCISE 2

Objectives: 1<sup>ST</sup> FUNCTION OF AN ISOPLETH LINE - SEPARATE DIFFERENT VALUES

Isopleth Rule: At the edge of the data you may stop an isopleth line

2<sup>ND</sup> FUNCTION OF AN ISOPLETH LINE - ISOPLETH LINES HAVE THEIR OWN DISTINCT VALUE

Draw a line that separates all the 5's and 4's. More than one line may be necessary to complete this exercise. What is the value of the isopleth you drew?



EXERCISE 3

Objectives:

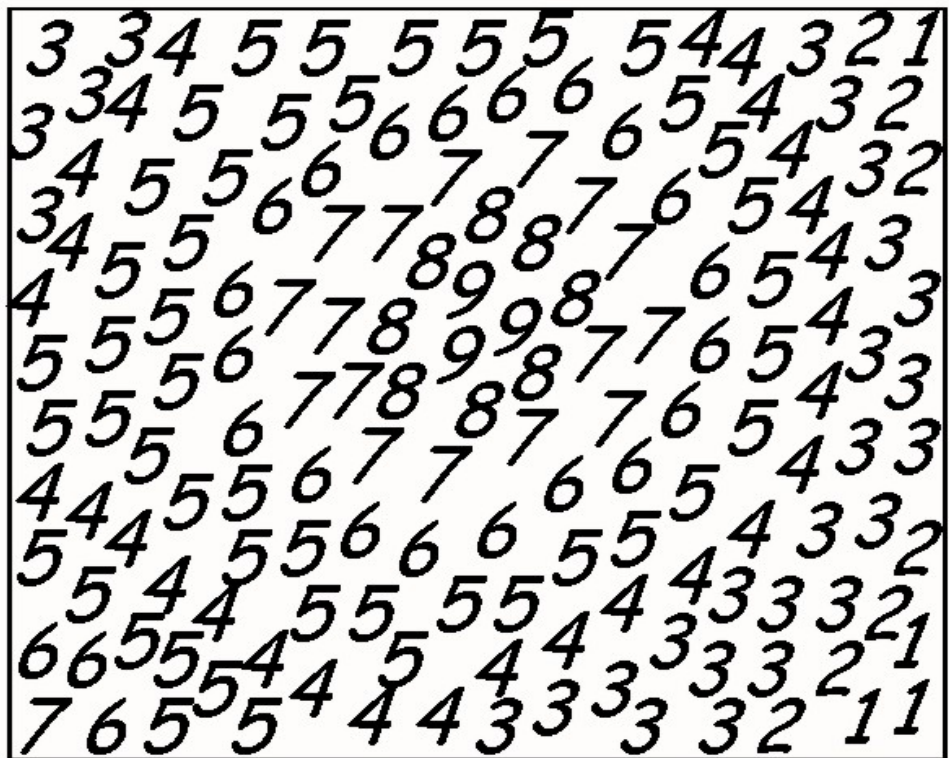
1<sup>ST</sup> FUNCTION OF AN ISOPLETH LINE - SEPARATE DIFFERENT VALUES

2<sup>ND</sup> FUNCTION OF AN ISOPLETH LINE - ISOPLETH LINES HAVE THEIR OWN DISTINCT VALUE

Isopleth Rule: 1<sup>st</sup> & 2<sup>nd</sup> Function must always be satisfied, even when drawing multiple isopleth with different values.

Isopleth Rule: Isopleth lines can NOT touch or cross!

In addition to separating areas of different values, isopleths also represent places of equal values (along the isopleth line itself). In the box to the right, draw the isopleth lines for values 2, 4, 6, and 8.



EXERCISE 4

Objectives:

**IF THERE IS NOT ENOUGH DATA, MORE POINTS CAN BE CREATED BY INTERPOLATION!  
ISOPLETH LINES HAVE A VERTICAL DISTANCE, CALLED THE ISOPLETH OR CONTOUR INTERVAL!**

**1<sup>ST</sup> FUNCTION OF AN ISOPLETH LINE - SEPARATE DIFFERENT VALUES**

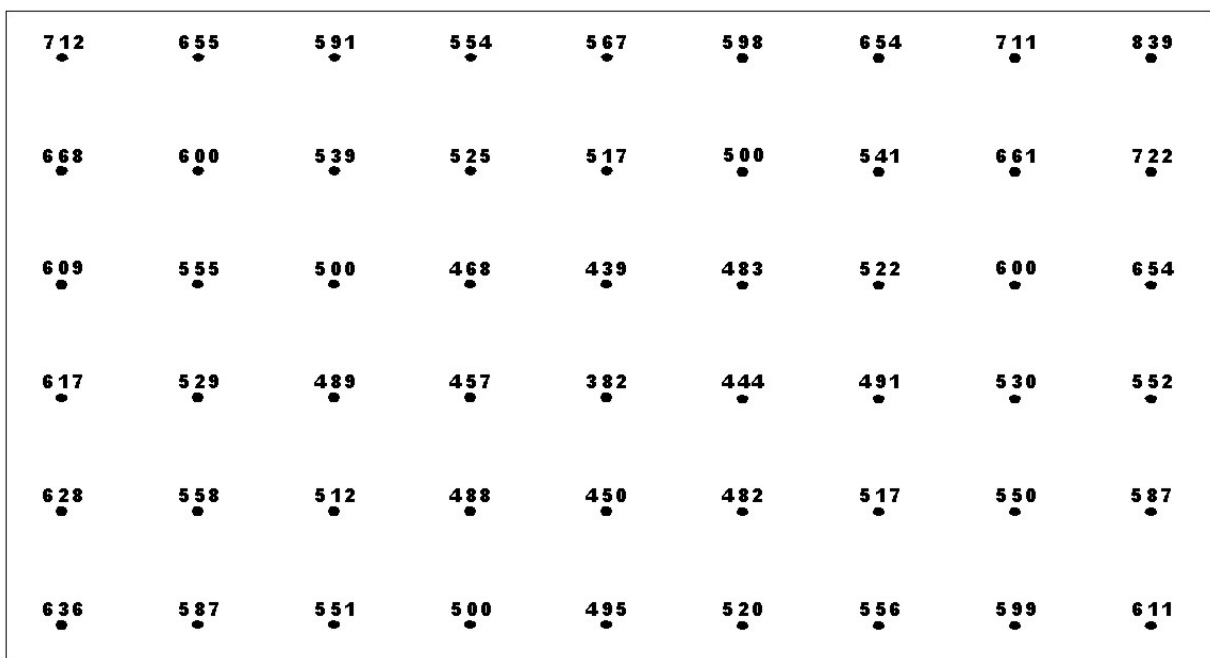
**2<sup>ND</sup> FUNCTION OF AN ISOPLETH LINE - ISOPLETH LINES HAVE THEIR OWN DISTINCT VALUE**

**Isopleth Rule: 1<sup>st</sup> & 2<sup>nd</sup> Function must always be satisfied, even when drawing multiple isopleth with different values.**

**Isopleth Rule: Isopleth lines can NOT touch, cross, or abruptly stop in the middle of the map!**

Draw isopleths at intervals of plus or minus 10. Start with the 500 isopleth line. If there are not enough data points, create more using the process of interpolation.

From the created 500 line move down at a contour interval of 50 (450, 400, etc.) as well as up (550, 600, etc.) drawing additional isopleths. Remember. You have greater control with more data points.



EXERCISE 5

Objectives:

**DRAW A TOPOGRAPHIC MAP USING CONTOUR LINES.**

**1<sup>ST</sup> FUNCTION OF A CONTOUR LINE - SEPARATE DIFFERENT ELEVATIONS (VALUES)**

**2<sup>ND</sup> FUNCTION OF A CONTOUR LINE - CONTOUR LINES HAVE THEIR OWN DISTINCT ELEVATION (VALUE)**

**Contour Line Rule: 1<sup>st</sup> & 2<sup>nd</sup> Function must always be satisfied, even when drawing multiple contour lines with different values.**

**Contour Line Rule: Contour lines can NOT touch, cross, or abruptly stop in the middle of the map!**

**Contour Line Rule: When crossing rivers or streams, contour lines make a notch pointing upstream!**

**Contour Line Rule: When a steady increase in elevation is met by a sudden, often circular reverse of the usual topographic trend (e.g., sinkholes, volcanic craters, etc.), contour lines in the reverse trend are represented with the addition of tick-marks pointing downslope.**

Drawing contour lines in the map below at a contour interval of 10ft. Start with a contour line of greatest resolution and extrapolate additional points as necessary. Features like rivers, ponds and mountain tops are marked as indicated.

REMEMBER ALL CONTOUR LINE RULES!!!!

Which rock type would you anticipate in the area?

