ESS 110: Introduction to Geology Dr. Woltemade Topographic Maps: Contour lines and elevations	**Name:** _____ **Section (circle):** **8:00 AM** **9:30 AM** **11:00 AM**

Contour lines

A *contour line* on the map (shown in brown) connects points of equal elevation above or below a reference plane (usually mean sea level, MSL). These lines illustrate the "topography," which is the shape of the landscape (hills, valleys, etc.). The *contour interval* is the vertical difference in elevation between adjacent contour lines (e.g. if the contour interval is 20 feet, lines might correspond to 420', 440', 460', etc.). *Index contours* are less frequent, are shown with a heavier brown line, and are labeled with the corresponding elevation. Some general rules for contour lines follow:

- A contour line connects points of equal elevation.
- A contour line never branches or splits.
- Steep slopes are shown by closely spaced contours, flat areas are shown with widely spaced contours (a completely flat area would not have any contour lines).
- Contour lines never cross, except to show an overhanging cliff (very rare).
- Hills are represented by a concentric series of closed contour lines (like a bull's eye).
- A closed depression (basin) is shown by concentric contour lines with hachures on the downhill side.
- Where contour lines cross a stream or a dry stream channel, they form a "V" that points *upstream.*

Relief refers to the difference in elevation between two points. *Total relief* is the difference between the highest and lowest points in an area (or on a map), while *local relief* refers to the difference in elevation between two nearby points (e.g. a hilltop and nearby valley).

1. Basics of contour lines. Describe locations based on distance from an obvious feature (e.g. "2.5 miles north of downtown Shippensburg")	
What is the *contour interval* on the Shippensburg map?	
What is the difference in elevation between *index contours?*	
Describe the contour lines in a relatively flat area.	
Where is an example of a flat area?	
Describe the contour lines in a relatively steep area.	
Where is an example of a steep area?	

2. Draw a set of three (3) contour lines (10' contour interval) showing:	
A 30-foot high hill	A 30-foot deep depression

3. Estimate the elevation of the following features. Be exact – take time interpreting the contours. Express your answers as at 10-foot range (e.g. 710 – 720 feet).	
The exact northwest corner of the map	
The lower summit of Timber Hill (located just to the NE of the word "Hill" and just west of the 696 highway symbol).	
The Reservoirs shown on top of a hill about 1 mile south of Shippensburg	
Conodoguinet Creek at the western border of the map *(Stream elevation is below the adjacent contour line)*	
Conodoguinet Creek at the northern border of the map	
The confluence of Middle Spring Creek (which forms the county boundary) and the Conodoguinet Creek *(A "confluence" is where two streams merge together.)*	

4. Interpreting contour lines.	
Burd Run flows in what direction?	
Describe the shape of the contour lines that indicate that flow.	
What is the highest elevation on the map? *(Look in the southern part of the map.)*	
What is the lowest elevation on the map? *(You found this previously where the largest stream exits the map area.)*	
What is the *total relief* on this map?	

5. Draw a contour map with a contour interval of 20 feet based on the points below. You will have to estimate the elevations between the known points. Label each of your lines with the elevation.