# GS104 Lab 6 Answer Key - Topographic Maps

## Pre-Lab Reading Questions

1. Contour lines-lines on topographic map connecting points of equal elevation
2. Contour interval - elevation difference between each contour line on the map
3. Relief - difference in elevation between two points on a map
4. Latitude - North-South angular measurement relative to the equator, with east-west lines (equator = 0 degrees lat, North Pole = 90 deg. N. lat, South Pole = 90 deg. S. lat, Monmouth = 45 N. Lat.
5. Longitude - East-West angular measurement relative to the prime meridian (line from north pole to south pole, passing through Grenwich, England), with north-south lines (prime meridian = 0 degrees long., international dateline = 180 deg. long. west (or east))
6. Fractional Scale - scale of a map given in ratio form (e.g. 1:24,000 - 1 map unit of distance = 24,000 map units of distance: e.g. 1 in = 24,000 in, or 1 mm = 24,000 mm)
7. What is the difference between "True North" and "Magnetic North" - true north is the geographic north pole of the earth (where Santa Clause lives), magnetic north is the north pole that a compass points to (TN and MN do not coincide exactly). The magnetic declination of a map is the angular difference between the position of True North and Magnetic North at a given location.

## Scale

1. 1:24,000 - 1 in on map = 24,000 in on ground = 2000 ft on ground

2. 1:62500 - 1 in on map = 62500 in on ground = 5208 ft on ground

3. 1 mile = 5280 ft, 1 in = 1 mile = 5280 ft = 63360 in; thus the map scale is 1:63,360

4. The largent scale map will show the most detail, hence the 1:24,000 does.

5. Draw a bar scale... you know what to do.

6. Figure it out...

## Topo Map Construction

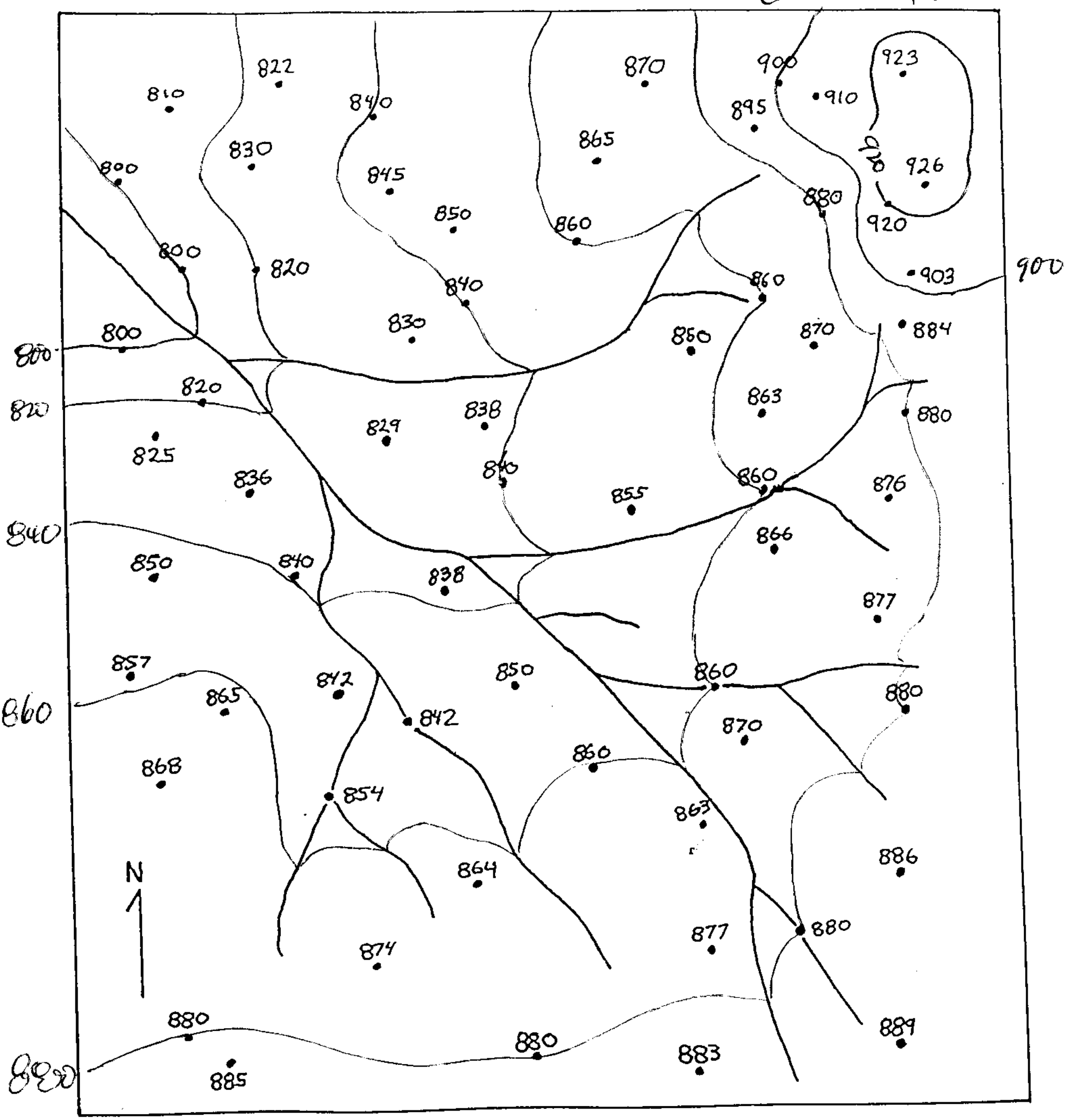
See map on next page...

KEY

**Construct a Topographic Map from surveyed data points.**

On Figure 1, draw all the contour lines using a contour interval of 20 feet. If you have a pen, put it away, and **get a pencil**. ("Only one who is perfect in every way contours with a pen.") Study the map and locate the higher and lower areas. *Lightly* draw in contour lines starting either at the high or low lines. When you are finished and satisfied, darken and label the contour values neatly. **Figure 1:**

CI = 20 Ft

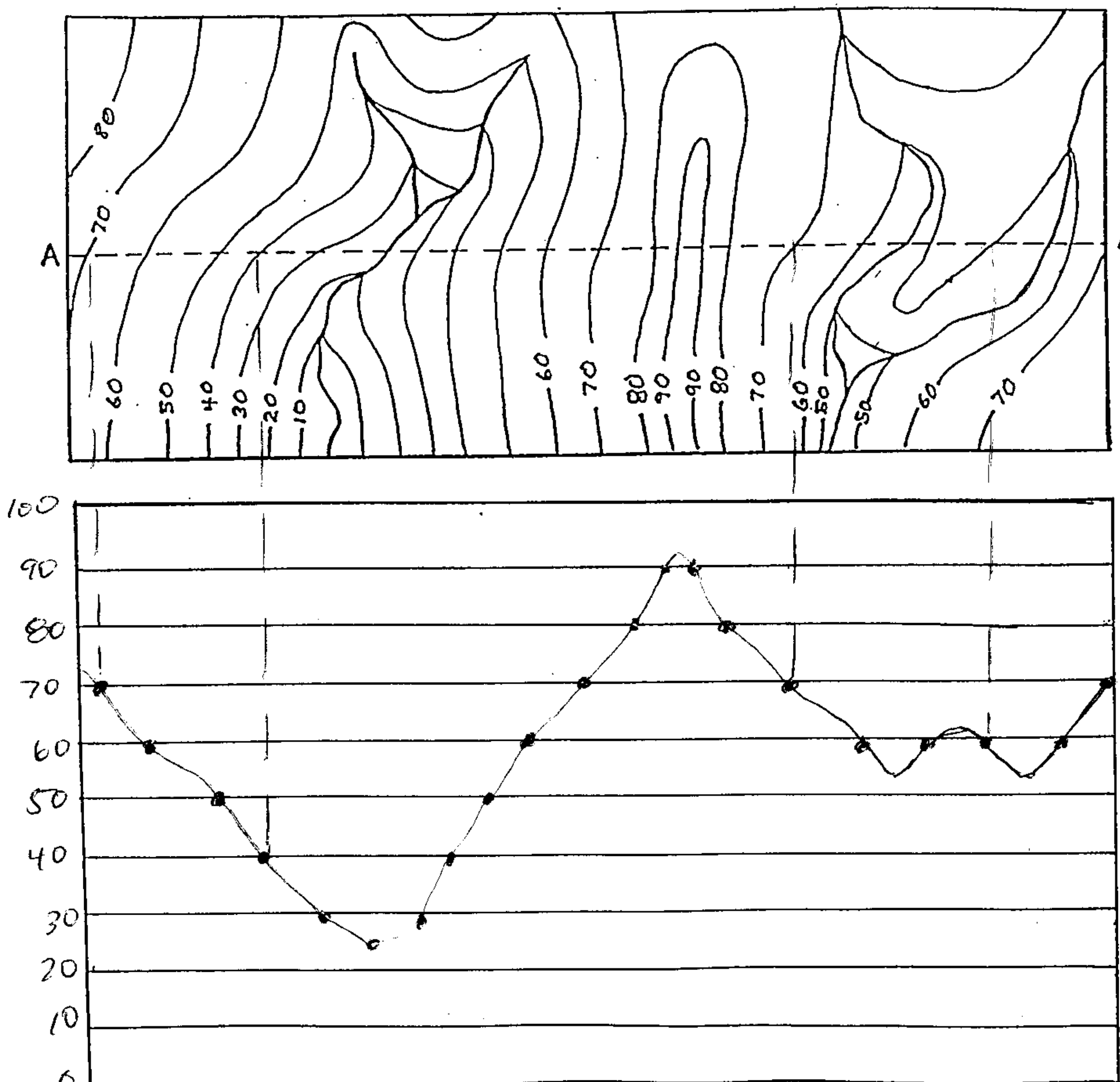


Key

**Construct a Profile from a Topographic Map**

Profiles are made to illustrate the shape of the surface of the earth between two designated points. These two points are at the ends of the line of profile which is labeled on the map used in the construction of the profile. To construct the profile, from each intersection of a contour and the line of profile on the map, project a perpendicular line downward from the line of profile until the perpendicular line crosses the horizontal line having the same elevation as the contour line. Make a dot on each horizontal for each intersection of a contour line and the line of profile. After all the dots are made, connect the dots by a smooth line which represents the profile of the earth's surface.

On Figure 2, draw a profile along line A to A' in the space provided beneath the map. Be sure to label the elevations at the side of the profile. **Figure 2:**



**Monmouth Quadrangle, OR**

1. U.S. Geological Survey
2. 1970
3. MN is 20.5 degrees east of TN
4. Southern Lat = 44$^{o}$45' N , Northern Lat = 44$^{o}$52'30" N
5. Total degrees of Latitude on edge = 7.5 '
6. East side Long = 123$^{o}$7'30" W, West side Long = 123$^{o}$ 15'
7. Total degrees of Longitude on edge = 7.5 ' (this map is a 7.5 ' quadrangle, 7.5 ' of lat x 7.5 ' of long)
8. C.I. = 10 ft
9. Index contours = 5 x 10 ft = 50 ft
10. Highest El = 1010 ft (Salem Hills), Lowest El = 145 (Willamette R.) / Relief = 1010 ft - 145 ft = 865 ft
11. map scale: 1 in = 24,000 in; 1 ft = 24,000 ft; 1 in = 2000 ft; 1 in = 0.38 mi
12. south quad = Lewisburg, East Quad = Sidney, northwest quad = Dallas, west quad = Airlie North
13. Momouth El~ 210 ft
14. BM at Independence = 168 ft
15. Miles from 99 at Main to Luckiamute = ~4.7 miles
16. Cupids Knoll: Latitude = 44$^{o}$51' N, Longitude = 123$^{o}$14.5 ' W
17. Elevation of Cupids Knoll = 321 ft
18. The northwest side would be easiest to climb. The farther the spacing between contours, the more gentle the slope (and vice versa)

**Three Sisters, OR Quadrangle**

1. Scale 1:125,000

2 C.I. = 100 ft

3. Long East = 121$^{o}$30' W    Long West = 122$^{o}$
4. 30 ' of long. on southern edge (this is a 30 ' quad)
5. Three Sisters Quad. covers a greater area, but with less detail
6. Sand Mountain - a volcanic cinder cone?
7. Mt. Washington is steepest and most dissected by erosion, it is probably oldest. Black Butte displays a classic volcano shape, and has not been very eroded, it's likely younger.
8. Distance from Little Belknap to Huckleberry = 3 miles, elevation difference = 10 contours x 100 ft/contour = 1000 ft relief
9. figure it out for yourself, and ask me later!