Lab 6: Cross Sections

For this week’s lab, you will construct two cross sections (A-B and C-D) across a geologic map. This map is similar to Map 3 from last week but not identical. To construct a cross section you will have to perform the following steps:

- Construct the topographic profile along each cross section line (A-B and C-D).
  - Cut out the grids for each cross section.
  - Line up the grid with the section line on the map and mark the location where each topographic contour intersects the cross section line.
  - Transfer these markings down onto the grid and trace out a smooth topographic profile
- Using a similar technique, transfer the location of geologic contacts and fault to your cross section lines.
- Determine the true attitude of relevant geological features and put strike and dip symbols on the map. Determine the sense of motion on the fault and add the appropriate symbols.
  - Refer to the lecture notes and handouts for three-point problems
- For each contact (stratigraphic or fault), determine whether it is necessary to calculate the apparent dip. If $\beta < 10^\circ$, you may omit this step (as the $\cos(10^\circ) \approx 0.98$, it makes very little difference)
  - Please note that there was a typo in last week’s handout on the equation for apparent dip. It was given correctly in the first instance but when rearranged to solve for $\alpha$ the cosine was changed to tangent. This was incorrect, it should read:

$$\alpha = \tan^{-1}\left[\tan(\delta) \ast \cos(\beta)\right]$$

- Draw in the contacts on the cross sections at appropriate dip or apparent dip angles. Project the contacts down to the base of the grid to complete the sections.

TURN IN:
1. Neatly colored map - showing work on it if appropriate
2. Neatly colored and completed cross section grids A-B and C-D
3. All calculations
4. Half page summary of the geological history of the map area
Figure 1: You will recognize this map from the previous lab but it has been modified. Today you will construct a topographic profile across the map and use the surface geology to interpret the geologic cross section to depth.
Figure 2: Cut out each grid, leaving a few mm of blank paper around the edges. Make sure the grid fits exactly along the cross section line (I’m concerned about photocopy distortion; just move the edges a bit if necessary)