

Projection: Three point Problem

In the elevation of a planar surface, which is Known at three points that do not lie along a straight line, its strike and dip may be determined graphically by geometrical projection (Figure 1).

Requirements:

- 1- Geographic location of the points.
- 2- Elevation of the points with respect to certain reference horizon(e.g. sea level), provided that:
 - a- The three points form a triangle.
 - b- The surface is not folded or warped among these three points.

Exercise 1: Points (B & C) lie 600 meter to the (S50W and S40E) of point (A) respectively. The elevation from a fault surface are 1000, 400 and 700 meter above sea level at points (A, B, and C) Respectively. Determine the attitude of this fault.

Exercise 2: Points A, B and C, all on the top of a sandstone bed. Point B lays N43W of A at a distance of 600 meter. Point C lays NSOE of A at a distance of 700. The elevation of points A, B, and C are 900, 1200, 1450 meter, respectively. Find the attitude of the top of the sandstone.

Exercise 3: Points A, B, and C have elevations of 200, 600, and 1000 meter, above mean sea level respectively. Point A lies 700 meter to the N60E of point B. Point C lies 500 meter to the SE of point B. A conglomerate layer was encountered through wells at depths of 600, 800 & 900 meter at the points A, B & C respectively. Find the attitude of this conglomerate layer.

Procedure:

- 1- Plot the position of the points by employing appropriate scale.
- 2- Join a highest point elevation with a lowest point elevation.
- 3- Divide plotted line (in step2) to the *equidistance units*. Then, find a point on this line which has the same elevation to the third point (intermediate altitude).
- 4- Connect these two points that have the same elevation by a line, which represent a strike line.
- 5- Draw another strike line parallel to the first strike.
- 6- True dip direction (T.D.D.) is constructed at any convenient place perpendicular to the strike line, and *pointing from higher strike to the lower strike*.
- 7- Consider the T.D.D.as fold line, and draw the difference in elevation between successive strike lines as unit depth ($d=h$) to construct the trace of the vertical section on the horizontal plane, and then measure the angle of dip.

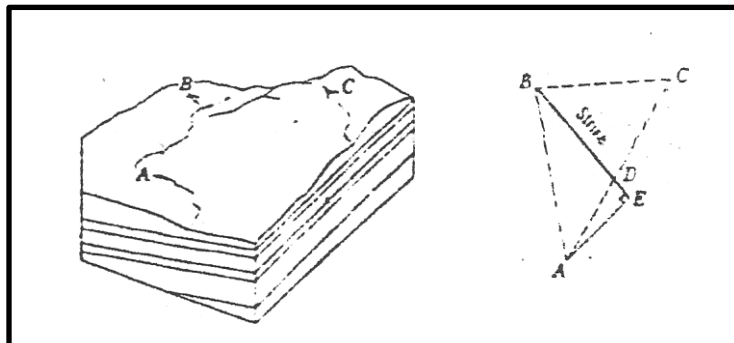


Figure 1: Determining average strike and dip by making a construction based on a map of three point on a bedding surface