Stereographic Projection Questions

1) (i) Plot on a lower hemisphere equal angle projection the line of maximum dip, great circle and the normal to a plane of dip direction/dip angle 328/33.

(ii) The normal to a plane on a lower hemisphere equal angle projection of 90 rnm diameter plots 18.0 mm to the east of the north-south diameter of the net, and 23.0mm north of the east-west diameter, when the projection is at its home position. Un-plot this point to determine the dip direction/ dip angle of the plane.

2) Two lines of trend plunge 138/64 and 236/39 are known to lie in the same plane. Determine:

(i) The dip direction/dip angle of the common plane,

(ii) The internal angle between the two lines, and

(iii) The pitch of each of the lines in the common plane.

3) Two planes of dip direction/dip angle 105/58 and 216/34 are known to intersect. Determine:

The trend/plunge of their line of intersection.

4) Two boreholes are drilled from the face of a quarry, one at

an orientation7 of ***298/38,*** and the other at an orientation of ***055/72.*** On a sheet of tracing paper over a hemispherical projection, plot the points corresponding to these boreholes, and then determine:

(a) the orientation of the plane containing the **two** boreholes;

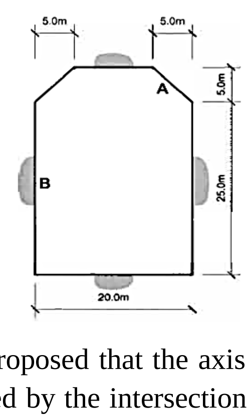
(b) the acute and obtuse angles between the two boreholes;

(c) the orientation of a borehole which bisects the acute angle; and

(d) the orientation of a borehole which is perpendicular to the two holes already drilled.

5) The diagram on the right shows the cross-section of an underground machine hall. The hall is to be excavated in a sequence of metamorphosed argillaceous rocks of unit weight 22 kN/m3, which contains five fracture sets with the following orientations:
Set Dip direction Dip angle

Set	Dip direction	Dip angle
1	058°	54°
2	195°	70°
3	127°	81°
4	160°	32°
5	335°	64°



Each set has a friction angle of approximately **30°** and zero cohesion. It is proposed that the axis of the machine hall will be oriented on a heading **030°** and will be horizontal formed by the intersection of the fracture sets and the roof. Determine the kinematic feasibility of all the tetrahedral blocks.