

Structural Geology

Practical 2

Stereonet 2

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STEREONETS 2 QUESTION SHEET

PROBLEM 1 PLOTTING THE ORIENTATION OF A LINE IN A PLANE

a- Plot the orientation of the following data:-

Plane- 190/44

Line- 35→322

The line should plot as a point on the great circle which represents the dip and strike of the plane.

Another way of recording the orientation of the line is to describe the angular relationship which exists between the line and strike of the plane which contains the line. This value is called the PITCH (or rake).

b- Measure the pitch of a line within a plane.

- Rotate the overlay until the 190° mark overlies the north index, so that the projection of the plane 190/44 overlies a great circle.

- The graduations along the trace of the great circle occur every 2°. Count along the trace of the great circle from the strike (190°) until the point is reached.

The answer should be 124°. Thus, the line 35→322 pitches at 124° in the plane 190/44.

c- Measure the pitch of the lines given in Table 1 within the planes given in Table 1. Write your answers in Table 1.

d- Measure the plunge and plunge directions of lines which have a pitch within the planes given in Table 2.

PROBLEM 2 PLOTTING THE POLES TO PLANES

As you have probably noticed, your overlay can get very cluttered by the great circles which represent the planes you are plotting!

Structural geologists get around this problem by plotting the poles to planes. The pole is the projection of a line which is normal (90°) to a plane.

To plot a pole to a plane:-

- Plot the great circle to the plane 020/40. By definition, the pole to this plane is orientated at 90° to the plane. To plot the pole, leave the 020° mark over the north index and count 90° in from the point of intersection of the 020/40 great circle with the east-west line and plot the point (The point you plot will be to the west of the centre of the stereonet).

You can check that the point you have plotted truly represents a line normal to 020/40, by measuring the angular relationship between the point and the strike of the plane. Do this by counting along the great circle joining your pole to the 020° mark which overlies north index. The answer should be 90°.

a- Plot only the poles to the following planes

030/50
275/40
345/20
118/70

The pairs of planes in Table 3 represent the orientations of the limbs of folds. Plot their great circles and poles.

b- Determine the orientation of the fold axis. (Remember, the fold axis is the line of intersection of the two fold limbs (planes).

c- Determine the orientation of the axial plane. To do this mark the mid-point between the two poles along their common great circle. This point and the fold axis both lie on the axial plane. Rotate the overlay until the mid-point between the two poles and the fold axis share a common great circle. Mark this great circle on your overlay as it is the projection of the axial plane.

Place your answers in the table provided and hand in the Table sheet and tracing paper overlays which will be marked and returned to you.

STEREONETS 2 ANSWER SHEET

Table 1

Strike & Dip of Plane	Plunge & Plunge direction of line	Pitch of line
040/70	35→055	
107/30	30→197	
290/60	17→100	
150/90	50→150	
250/70	65→019	

Table 2

Strike & Dip of Plane	Plunge & Plunge direction of line	Pitch of line
084/70		90°
300/10		110°
217/50		115°
138/80		145°
065/50		180°

Table 3

Limb orientation data	Fold axis (line)	Fold axial plane
345/20 & 180/40		
110/45 & 274/34		
230/10 & 009/70		
034/60 & 124/70		