EAS 421 Structural Geology and tectonics

Mid-term test format example and sample questions
Answer all the questions.

Permitted to use: Formula sheets (unmarked); Wulff net; Schmidt net; calculator; tracing paper; graph paper; drawing instruments.

At the end of the test, pass in this paper and all the paper you have used.

Time allowed: 45 minutes

1   The table shows tabulated eigenvalues and eigenvectors for a distribution of orientations of poles to planes.

	E1	E2	E3
Principal direction	30-173	07-079	59-338
Eigenvalue	0.15	5.82	28.02

   a   Neatly sketch an equal-area projection, with contours, to show a possible form for the distribution of data. (You are not expected to construct an accurate projection)

   b   Briefly explain one geological process that might produce a distribution of poles to planes like the above example.   (20%)

2   You are provided with a vector diagram (Fig. 1) and a map (Fig.2) for a triple junction between three plates A,B, C.

   For each plate boundary, explain what is the type of boundary and what is the direction and rate of relative plate motion.   (30%)

3   Explain the difference between:
   a)   Stress and strain
   b)   Normal stress and shear stress
   c)   Mean stress and deviatoric stress   (30%)

4   Describe two methods for determining information about the state of stress from boreholes in the Earth at present day.   (20%)