

Three Point Problems and Map Interpretation

Exercise 1 (29 points total)

Three points with the following coordinates lie on a planar bed:

A: 100m N, 400m E, 400m elev; B: 0m N, 0m E, 200m elev;

C: 300m N, 0m E, 500m elev. You are asked to find the orientation of the plane as in the example of 3.1. Round your answers to the nearest degree.

- 1a Plot and label the points on a separate piece of paper using a scale of 5 cm = 250 m. Put the origin in the center of the page, and draw the east-axis parallel to the long dimension of the page. (3)
- 1b **Add a correctly dimensioned scale bar and a north arrow.** (2)
- 1c Draw and label a line of strike (structure contour) through pt A for the bed (2)
- 1d Determine to the nearest 45° (i.e., N, NE, E, SE, S, SW, W, or NW) the direction of dip and write it here: direction of dip = _____(1)
- 1e Measure the strike of the bed (**use the right-hand rule**) and write it here:
strike = _____(2)
- 1f Draw a dashed cross section line (fold line) through point E (plot E at 0m N, -200m E) that is perpendicular to strike and that divides the top view of the map from auxiliary view A. Label the elevation of this dashed line "600m" in auxiliary view A. (2)
- 1g Project points A, B, and C onto the auxiliary cross section view, then measure and label the dip of the plane and write it here (include the dip direction):
dip = _____(4)
- 1h Measure the horizontal component of the shortest distance (H) on the map between the line of strike and point B (use the map scale) and write it here: distance = _____(2)
- 1i Label on the cross section view the vertical distance (V) and horizontal distance (H) between your line of strike and point B; and label on the top view the horizontal distance (H) between your line of strike and point B; three labels total (3)
- 1j Write the equation for the dip of the plane as a function of H and V here:
dip = _____(2)
- 1k Based on the mathematical expression relating the dip of the plane to H and V, calculate the dip of the plane and write it here: dip = _____(2)
- 1l The trend of the pole to the bed is: _____(2)
- 1m The plunge of the pole to the bed is: _____(2)

Exercise 2 (See attached geologic maps of the Graveyard Quadrangle; elevations are in kilometers, north is to the top of the map) **(59 points total)**

2a Determine the strike, dip, and dip direction of dikes A, B, C, and D. Round your answers to the nearest degree.

	A	B	C	D
Strike (4x4)				
Dip (4x4)				

- 2b Draw attitude symbols on each map that shows the strike and dip of the dike. Locate the symbols where you collected information to determine the strike and dip of the features. **(4x3)**
- 2c Draw a line through the origin showing the orientation of a vertical cross section plane that is perpendicular to the strike of dike A that extends from one edge of the map to the other. Label the end points E and E' **(3)**
- 2d Draw cross section E-E' on a separate piece of paper showing the topography and dike A **(10)**
- 2e Does this cross section plane allow you to see the true dip of dike A? Explain briefly.

(2)







