

Problem Set: The 3-point problem

Many geologic problems in the realm of basin analysis involve discerning the geologic history of a region based on subtle variations of the attitudes of sedimentary beds. These variations are interpreted in terms of direction and rate of sediment influx, amount of regional topographic relief, rate and form of tectonic deformation, etc. Here is an example of data that might be the basis of such an analysis.

A set of three drillholes has been completed, surveyed, and logged. The depths of seven different stratigraphic horizons, A through G, encountered in each hole is given in the table below. Also shown, at the top, are the hole locations on our project grid. Assume that each hole is perfectly vertical (no deviations of the hole, a remarkable accomplishment in its own right).

	DH-1	DH-2	DH-3
x-loc'n:	500	2200	-620
y-loc'n:	-1000	1250	1708
elevation:	100	-5	65

The intercepts:

A	122.5	434.9	65.3
B	126.5	551.1	119.0
C	324.9	565.4	255.8
D	1535.3	1317.3	267.2
E	2079.5	1580.3	298.4
F	3174.6	1629.4	310.6
G	6064.0	1672.2	973.6

Write a computer program to determine the slopes and z-intercepts of each horizon. What are the strikes and dips of each? What can we conclude about the geologic history of this area if each horizon is a sedimentary layer?