

Due April 10

CVEN 3698
Engineering Geology
Attitude of Geological Planes

Before proceeding with this assignment, you are asked to read pp. 228-231 in the *Laboratory Manual in Physical Geology* (9th Edition). **Distributed in class.**

1) For the geometry of the plane shown in Figs. 1(a) and 1(b), derive the following two equations:

$$\tan \psi_a = \tan \psi \cdot \cos \beta$$

$$\tan \psi_a = \tan \psi \cdot \sin \alpha$$

where ψ is the true dip of the plane and ψ_a is its apparent dip in a direction making a horizontal angle α with the strike direction (or β with the dip direction).

2) If the attitude of a plane is N 75W 22 NE, what is its apparent dip in the direction N 50°?

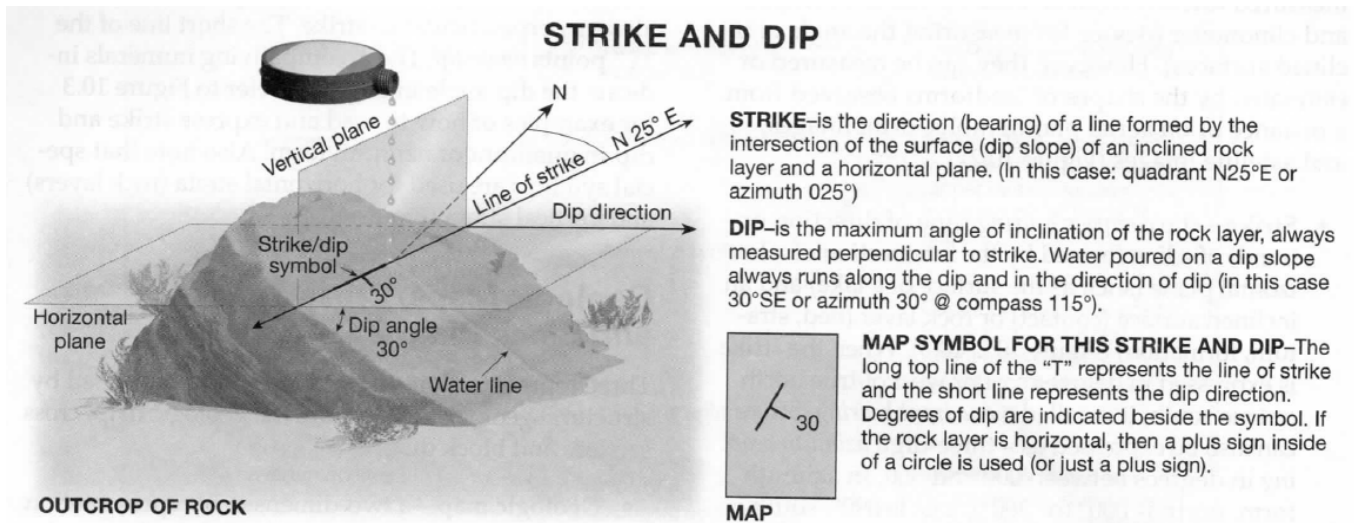
3) Two lines define a plane. The following two apparent dips have been measured.

$$\psi_{a1} = 10^\circ \text{ in the N } 72\text{W direction}$$

$$\psi_{a2} = 25^\circ \text{ in the N } 35^\circ \text{ direction}$$

Determine the strike and true dip angles of the plane.

4) A certain E-W bed dips 40 degrees due North. In what direction(s) will its apparent dip be exactly half as great? There are two answers to that question.



(a)

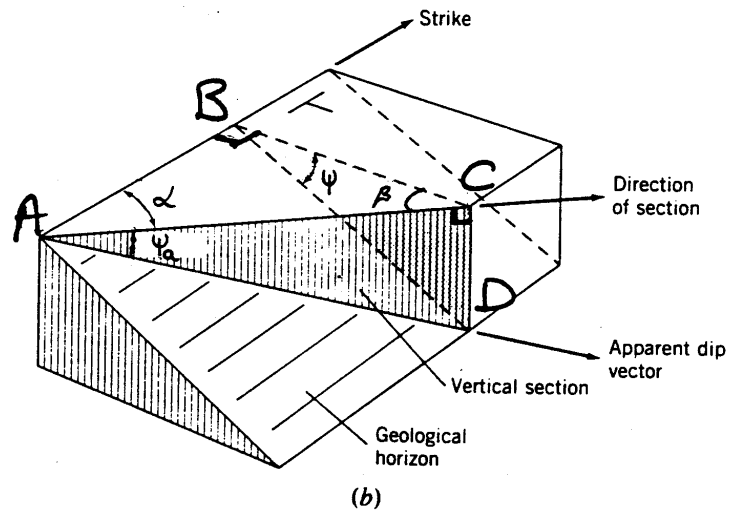


Figure 1. (a) Block diagram showing the strike, dip and dip direction angles of a geologic plane (after Bush, 2011) (b) Definition of the apparent dip ψ_a in a direction α with respect to the strike line (after Goodman, 1993).