PROBLEM

Given two apparent dips, (1) 28, N 56 W, and (2) 22, N 14 E, find the true dip.

CONSTRUCTION OF TRUE DIP (Fig. 11.9)

1. Plot the two apparent dip lines:
   (a) Line 1: revolve the north mark ~~45°~~ 56° clockwise and count off ~~30°~~ 28° from north along the north-south diameter.
   (b) Line 2: revolve the north mark 14° anticlockwise and count off 22° from north.
2. Revolve the overlay until the points representing the apparent dips lie on the same great circle. Trace in this arc. The true dip of the plane is read when traced; the strike is easily determined by restoring the overlay to the north position.

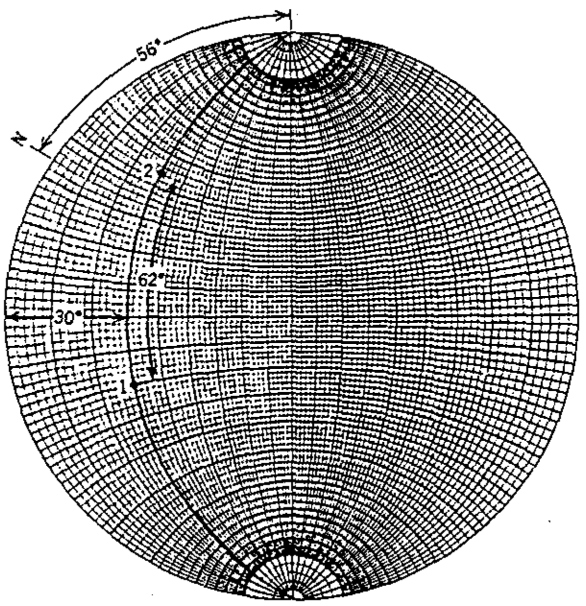

FIGURE 11.9 True dip from two apparent dips: the overlay in position for locating the great circle.

ANSWER

The true attitude is N 56 E, 30 N. The angle between the two lines is the angular distance between the two points (= 62°).

PROBLEM

Given two planes, (1) N 50 E, 60 SE, and (2) N 70 W, 20 S, find the plunge of the line of intersection.

CONSTRUCTION OF THE INTERSECTION OF TWO PLANES (Fig. 11.10*a*)

1. Plot the two planes:
   (a) Plane 1: revolve the overlay 50° anticlockwise from north and count off 60° from the east point along the east-west diameter. Trace in this great circle.
   (b) Plane 2: revolve the overlay 70° clockwise from north and count off 20° from the west point on the east-west diameter, and complete the great circle.
2. The point of intersection of the two great circles represents the line of intersection of the two planes. To read the plunge angle and bearing, revolve this point until it lies on the north-south diameter of the net.

ANSWER

The plunge of the line of intersection is 20, S 38 W.

Another useful relationship between two intersecting planes is the dihedral angle. This can be easily determined by measuring the angle between the poles of the two planes. Alternatively, by constructing the great circle of which the line of intersection is the pole, the angle between the two planes can be read directly (See Fig. 11.10*b*). Note that the poles of the planes lie on the great circle perpendicular to the line of intersection.

ROTATIONS

In a number of situations it is necessary to geometrically *rotate* structural elements in space. Every rigid body rotation can be defined by an angle and sense of rotation about a specified axis. The simplest rotation to perform on the stereonet is when the axis R is vertical. Fig. 11.11 illustrates a plane (N 0, 45 E) rotated 45° clockwise about a vertical R to a new orientation (N 45 E, 45 SE). Either the great circle trace or the pole of the plane may be rotated with equivalent results. As is evident from this figure, to find the new position one simply revolves the overlay sheet by the required angle—a familiar manipulation. Yet there is an important difference. Before, the process of turning the overlay about the center of the net was one of convenience in plotting and measuring, but the overlay always carried with it the North mark, so that the original orientations were never really changed. The term *revolve* has been used specifically to describe this maneuver. In contrast, after rotation a plane or line has an entirely new orientation relative to some fixed coordinate direction.

A rotation about a horizontal axis can also be performed readily on the stereonet. First,