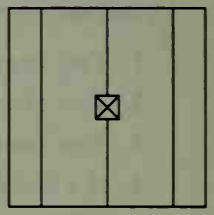
Application

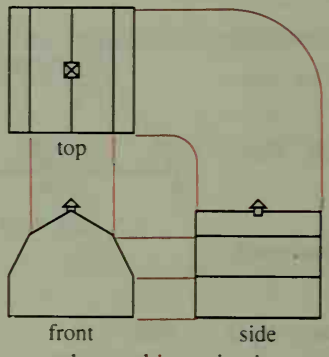
Technical Drawing



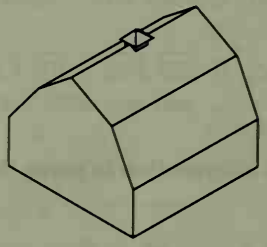
Can the shape of a three-dimensional object be determined from a single two-dimensional image? For example, if you photographed the barn shown on page 75 from a point directly above, then your photograph might look something like the sketch shown at the right. You cannot tell from this one photograph how the roof slopes or anything about the sides of the barn. You would have a much better idea of the shape of the barn if you could also see it from the front and from one side.

The three views of the barn are the parts of an *orthographic projection*, a set of projections of an object into three planes perpendicular to one another. They show the actual shape of the building much more clearly than any single picture.

To make an orthographic projection of an object, draw a top view, a front view, and a side view. Arrange the three views in an "L" shaped pattern as illustrated in the figure on the left below. Some corresponding vertices have been connected with red lines.



orthographic projection



isometric drawing

A related method of representing a three-dimensional object by a two-dimensional image is an *isometric drawing*. In this type of representation the object is viewed at an angle that allows simultaneous vision of the top, front, and one side. Unlike most drawings, however, an isometric drawing does not show perspective. Rather, congruent sides are drawn congruent. Because we are accustomed to seeing objects in perspective, an isometric representation can appear distorted to us. The following figures illustrate the difference between a perspective drawing (left) and an isometric drawing (right).