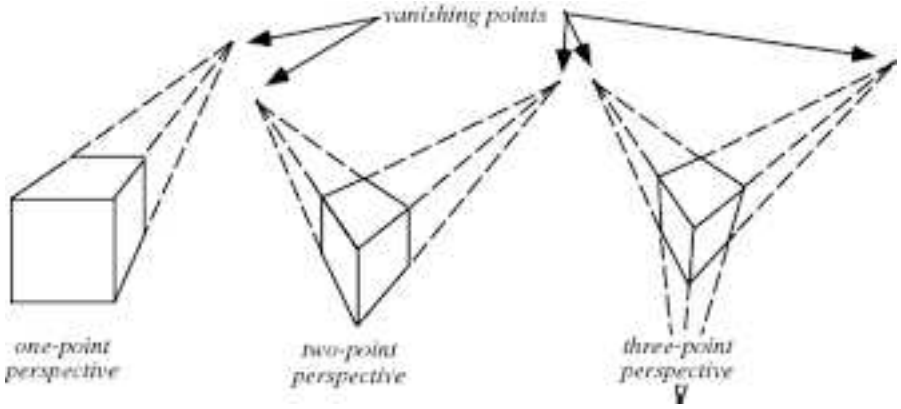
Projective Geometry

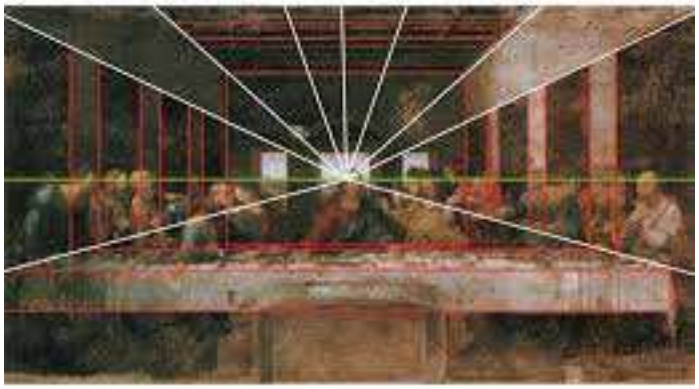
Much of the motivation for the study of **Projective Geometry** comes from art. How should one draw a three dimensional object in two dimensions and maintain a sense of depth?

In one-point perspective, all observation lines intersect at an ideal point along a horizon line. The concept grew out of the artistic view that parallel lines will intersect at ideal points on the horizon. Consider looking down railroad tracks and how the tracks appear to converge in the distance.

The first figure below is an example of a box drawn with one-point, two-point, and three-point perspectives. Notice that lines that would "normally" be parallel all intersect. Hence, projective geometry is a non-Euclidean geometry. In fact, one of the axioms for projective geometry requires that any two distinct lines intersect in at least one point.

The second figure below shows lines illustrating the use of one-point perspective in Leonardo DaVinci's "The Last Supper".





Leonardo Da Vinci, "The Last Supper" (1494-1498)