Why

Definition

The line through two points in n-dimensional space is the set of points which can be expressed as the sum of the first point and a scaled multiple of the difference between the second point and the first. An affine set is a subset of n-dimensional space which contains the lines through each of its points.

Examples

The empty set is trivially an affine set. The entire set of points in n-dimensional space is an affine set. Any singleton is an affine set.

Notation

The line through two points x and y in ^{n} is the set

$$*x + a(y - x)a \in andx, y \in^n.$$

Notice that the expression $x + a(y - x)$ is equivalent to $(1 - a)x + ay$.

Other Terminology

Some authors call affine sets affine varieties, linear varieties or flat.

prop The intersection of a family of affine sets is affine.