



Definition

The *closed line segment between* two points in n -dimensional space is the set of points which can be expressed as the sum of the first point and a scalar multiple of the difference between the second point and the first; where the scalar is in the interval $[0, 1]$. Thus, the closed line segment between two points is a subset of the line through the two points. The *open line segment between* x and y is the closed line segment with the points x and y .

Notation

The closed line segment between $x, y \in \mathbf{R}^n$ is the set

$$\{z \in \mathbf{R}^n \mid z = x + a(y - x), 0 \leq a \leq 1, x, y \in \mathbf{R}^n\}.$$

Notice that $x + a(y - x) = (1 - a)x + ay$.

