



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

We denote the closed line segment between x and y by $[x, y]$. So,

$$[x, y] = \{x + \alpha(y - x) \mid 0 \leq \alpha \leq 1\}$$

Notice that $x + \alpha(y - x) = (1 - \alpha)x + \alpha y$. Similarly, we denote the open line segment by (x, y) . These notations pleasantly generalize that of real intervals.

