



## Definition

The *closed line segment* (or *interval*) 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.



