

## SPACE DISTANCE

## Why

What is the distance between two points in space?

## Definition

We define the distance between two points in space as the length of the line segment connecting them. In terms of their coordinates  $(x_1, x_2, x_3), (y_1, y_2, x_3) \in \mathbb{R}^3$ , the *space distance* of two points is

$$\sqrt{(x_1-y_1)^2+(x_2-y_2)^2+(x_3-y_3)^2}$$
.

This is sometimes referred to as the *Euclidean distance*. We have thus defined a function mapping  $\mathbb{R}^3 \times \mathbb{R}^3$  into  $\mathbb{R}$ .

