



## Why

What is the distance between two points in a plane?

## Definition

We define the distance between two points in the plane as the length of the line segment connecting them.<sup>1</sup> In terms of their coordinates  $(x_1, x_2), (y_1, y_2) \in \mathbf{R}^2$ , the *plane distance* of two points is

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

This is sometimes referred to as the *Euclidean distance*. We have thus defined a function mapping  $\mathbf{R}^2 \times \mathbf{R}^2$  into  $\mathbf{R}$ .

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<sup>1</sup>This intuition will be expanded in future editions.



