Distance Formula

Examples & Non-Examples

Example	Example	Non-Example
$(1, 2)$ and $(4, 6)$ x_1 y_1 x_2 y_2 $\sqrt{(4 - 1)^2 + (6 - 2)^2}$	$(-3, 2)$ and $(5, -4)$ x_1 y_1 x_2 y_2 $\sqrt{(5 + 3)^2 + (-4 - 2)^2}$	$(1, 2)$ and $(4, 6)$ x_1 x_2 y_1 y_2 $\sqrt{(2 - 1)^2 + (6 - 4)^2}$

Definition

The **distance formula** is a mathematical equation used to calculate the **distance between two points** in the coordinate plane.

Definition:

The distance formula is a formula used to find the straight-line distance between two points (x_1, y_1) and (x_2, y_2) on the coordinate plane.

The Formula:

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

Origin:

- This formula comes from the **Pythagorean Theorem**, where the horizontal and vertical differences between points form the legs of a right triangle.

Example:

To find the distance between points $(1, 2)$ and $(4, 6)$:

$$\sqrt{(4 - 1)^2 + (6 - 2)^2} = \sqrt{3^2 + 4^2} = \sqrt{9 + 16} = \sqrt{25} = 5$$