

MYP 4 Math Criterion D

The Distance Formula

Lesson 1

What is the distance formula?

Distance Formula

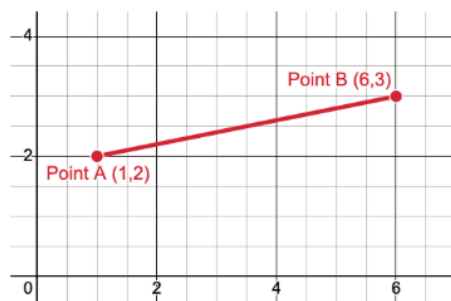
The distance (d) between two points $A(x_1, y_1)$ and $B(x_2, y_2)$:

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

- d is sometimes written as $|AB|$.
- Derived from **Pythagoras** (the line between two points forms the hypotenuse of a right triangle).

Practice Question 1

Find the Exact Distance of AB



Plugging in values for x and y :

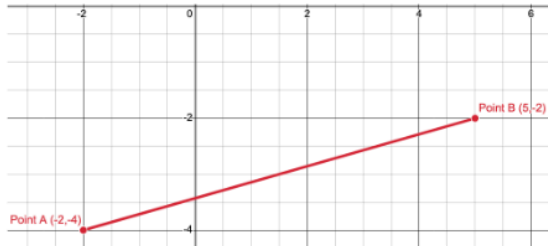
$$d = \sqrt{(6-1)^2 + (3-2)^2}$$

Solving for d :

$$\begin{aligned} d &= \sqrt{5^2 + 1^2} \\ d &= \sqrt{26} \text{ units} \end{aligned}$$

Practice Question 2

Find the Exact Distance of AB



Plugging in values for x and y:

$$d = \sqrt{(5 - (-2))^2 + (-2 - (-4))^2}$$

Solving for d:

$$d = \sqrt{7^2 + 4^2}$$

$$d = \sqrt{53} \text{ units}$$

Practice Question 3

If the distance between A(1,1) and B(a,5) is 5 units, find a.

Plugging in values for x, y and d:

$$5 = \sqrt{(a-1)^2 + (5-1)^2}$$

Solving for a:

$$5^2 = (\sqrt{(a-1)^2 + 4^2})^2$$

$$25 = (a-1)^2 + 16$$

$$(a-1)^2 = 9$$

$$a = \pm 3 + 1 \rightarrow \begin{cases} a_1 = 3 + 1 = 4 \\ a_2 = -3 + 1 = -2 \end{cases}$$