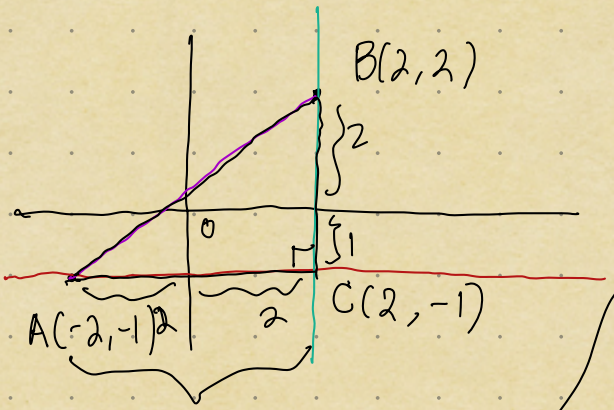
Ex: Find the distance between $A(-2,-1)$ and $B(2,2)$.

Use Pythagorean theorem



$AC = |2-(-2)| = 4$

$BC = |2-(-1)| = 3$

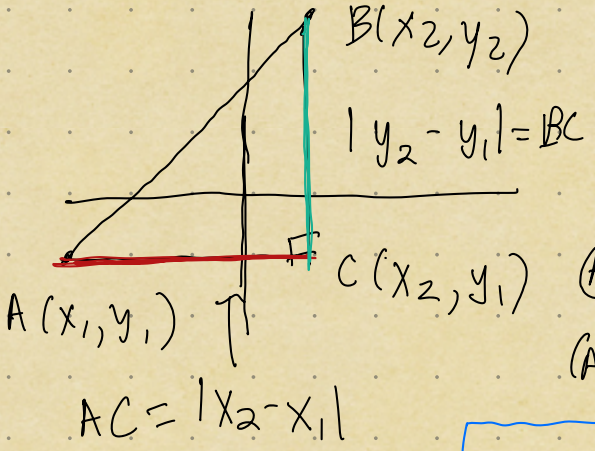
$(AB)^2 = (AC)^2 + (BC)^2$

$(AB)^2 = 4^2 + 3^2$

$(AB)^2 = 25$

$AB = 5$

In general...



$AC = |x_2 - x_1|$

By the Pythagorean theorem,

$(AB)^2 = (AC)^2 + (BC)^2$

$(AB)^2 = |x_2 - x_1|^2 + |y_2 - y_1|^2$

$(AB)^2 = (x_2 - x_1)^2 + (y_2 - y_1)^2$

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

Distance Formula: The distance between $A(x_1, y_1)$ and $B(x_2, y_2)$ is

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

Ex: Find the length of the line segment joining $J(-4, 3)$ and $K(2, -1)$.

x_1 y_1 x_2 y_2

or x_2 y_2 x_1 y_1

$$JK = \sqrt{(2-(-4))^2 + (-1-3)^2}$$

$$= \sqrt{36 + 16}$$

$$= \sqrt{52} = \sqrt{4 \cdot 13} = \sqrt{4} \cdot \sqrt{13} = \boxed{2\sqrt{13}}$$