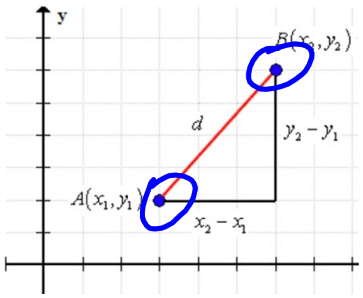
NOTES:

Distance Formula in One-Dimension
$x_2 - x_1$
Distance Formula in Two-Dimension
$d = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$ *

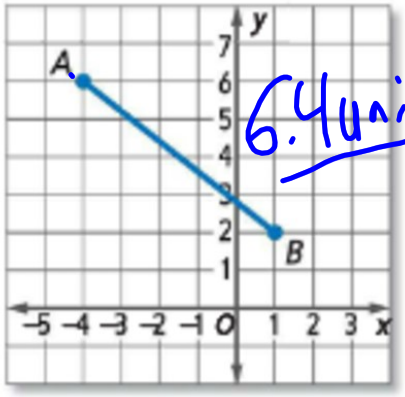
Where does this formula come from? Deriving the Distance Formula:



Pythagorean Theorem
$a^2 + b^2 = c^2$

Aug 22-1:07 PM

Example 1:
What is the distance from point A to point B?



6.4 units

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

$(1, 2)\ (-4, 6)$

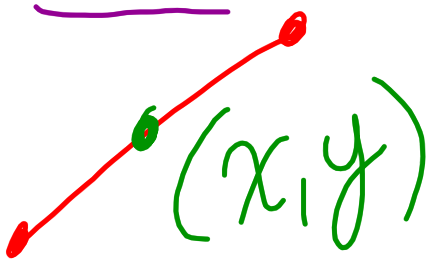
$x_1\ y_1 \quad x_2\ y_2$

$= \sqrt{(-4-1)^2 + (6-2)^2}$

$= 6.4$

Aug 22-1:07 PM

Midpoint Formula in One-Dimension
$\frac{x_2 + x_1}{2}$
Midpoint Formula in Two-Dimension
$\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$



Aug 22-1:07 PM

Example 2:
Find the coordinate of the midpoint of a segment with the endpoints of:

$x_1\ y_1\ x_2\ y_2$

a. $A(5, 12), B(-4, 8)$

b. [illegible]

$\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

$\left(\frac{5+-4}{2}, \frac{12+8}{2}\right)$

$(1/2, 10)$

$\left(\frac{1}{2}, 10\right)$

POINT-SLOPE FORM

$y - y_1 = m(x - x_1)$

(x_1, y_1) - point m- slope

TO USE THIS EQUATION YOU NEED BOTH

A point & A slope

Example 3:

Find the equation of a line using point-slope if the given the line goes through the points is (1,2) & (3,10)

$x_1 y_1 \quad x_2 y_2$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{10-2}{3-1} = \frac{8}{2} = 4$$

$y - y_1 = m(x - x_1)$

$y - 2 = 4(x - 1)$

$y - 2 = 4x - 4$

$+2 \quad +2$

$y = 4x - 2$