

Distance Formula

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

* derived from pyth. thm.
 $a^2 + b^2 = c^2$

* do not need to memorize

Example One:

Find the distance between $(9, 5)$ and $(-2, 0)$.

$$d = \sqrt{(-2-9)^2 + (0-5)^2}$$

$$d = \sqrt{(-11)^2 + (-5)^2}$$

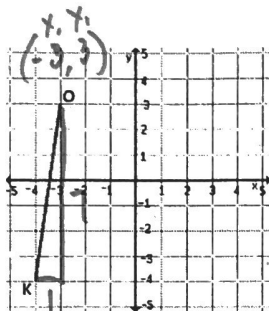
$$d = \sqrt{121 + 25}$$

$$d = \sqrt{146}$$

or

$$d \approx 12.08 \text{ units}$$

Example Two:



$(-4, -4)$
 X_2, Y_2

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

$$d = \sqrt{(-1)^2 + (-7)^2}$$

$$d = \sqrt{1 + 49}$$

$$d = \sqrt{50}$$

$$\sqrt{25 \cdot 2}$$

$$d = 5\sqrt{2}$$

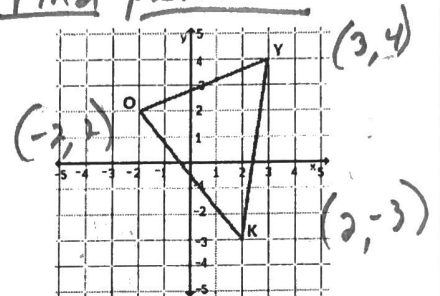
or

$$d \approx 7.07 \text{ units}$$

pyth. thm.
 $a^2 + b^2 = c^2$
 $\sqrt{1^2 + 7^2} = \sqrt{c^2}$
 $\sqrt{1+49} = c$
 $\sqrt{50} = c$

Example Three:

Find perimeter:



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

$$= \sqrt{5^2 + 2^2}$$

$$= \sqrt{25 + 4} = \sqrt{29}$$

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

$$= \sqrt{(-1)^2 + (-7)^2}$$

$$d = \sqrt{1 + 49} = \sqrt{50}$$

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

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

$$= \sqrt{16 + 25}$$

$$\sqrt{41}$$

$$P = \sqrt{29} + \sqrt{50} + \sqrt{41}$$

$$P \approx 18.86 \text{ units}$$