9.4 Notes Distance, Pythagorean Theorem & Perimeter

Name: ______________________

Distance Formula:

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

Example 1:

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

$x_1\ y_1 \quad x_2\ y_2$

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

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

$d = \sqrt{121 + 25}$

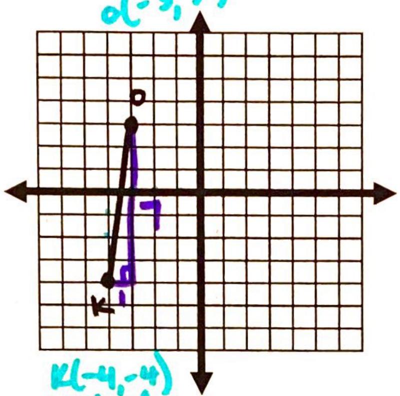
$d = \sqrt{146}$

$d = \sqrt{146}$ or ≈ 12.08

Example 2:

$x_2\ y_2$

$O(-3, 3)$



$K(-4, -4)$

$x_1\ y_1$

Using distance Formula:

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

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

$d = \sqrt{1 + 49}$

$d = \sqrt{50}$

$d = 5\sqrt{2}$ or 7.07

Using Pythagorean Theorem:

(make a rt Δ out of the segment)

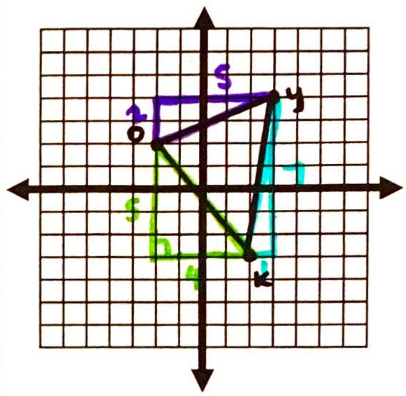
$a^2 + b^2 = c^2$

$1^2 + 7^2 = c^2$

$\sqrt{50} = \sqrt{c^2}$

$c = \sqrt{50} \rightarrow 5\sqrt{2} \approx 7.07$

Example 3:



Find the perimeter (you can use distance formula or Pythagorean theorem):

$\overline{OY}: 2^2 + 5^2 = c^2$

$\sqrt{29} = \sqrt{c^2}$

$c = \sqrt{29}$

$\overline{OK}: 5^2 + 4^2 = c^2$

$\sqrt{41} = \sqrt{c^2}$

$c = \sqrt{41}$

$\overline{KY}: 1^2 + 7^2 = c^2$

$\sqrt{50} = \sqrt{c^2}$

$c = \sqrt{50} \rightarrow 5\sqrt{2}$

$P = \sqrt{29} + \sqrt{41} + 5\sqrt{2} =$

$\boxed{\approx 18.86}$

Find the perimeter of the figure:

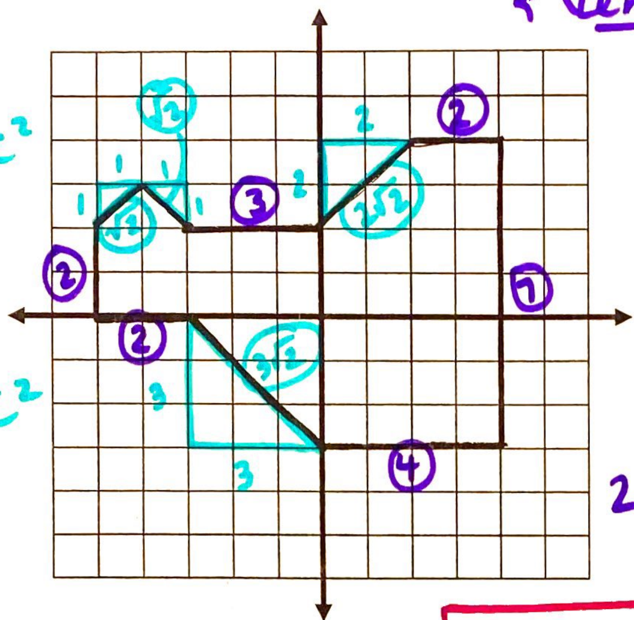
Example 4:

*Count the length of horizontal & vertical sides.

$1^2+1^2=c^2$

$\sqrt{2}=\sqrt{c^2}$

$c=\sqrt{2}$



Perimeter = See below!

* Use Pyth. Th or Distance Formula to find slanted sides.

$2^2+2^2=c^2$

$\sqrt{8}=\sqrt{c^2}$

$c=2\sqrt{2}$

$2+2+4+7+2+3=20$

$\sqrt{2}+\sqrt{2}+2\sqrt{2}+3\sqrt{2}=7\sqrt{2}$

$$\boxed{P = \text{Exact: } 20+7\sqrt{2} \quad \text{Approx: } 29.9}$$

$3^2+3^2=c^2$

$\sqrt{18}=\sqrt{c^2}$

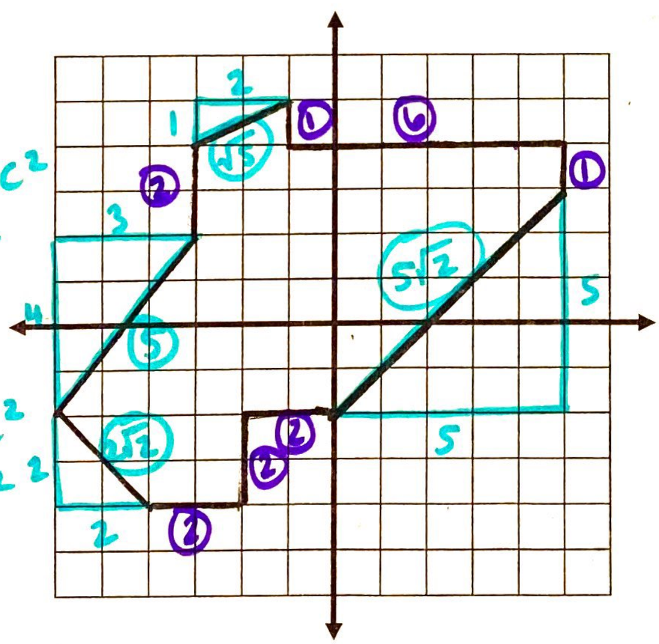
$c=3\sqrt{2}$

Example 5:

$1^2+2^2=c^2$

$5=c^2$

$c=\sqrt{5}$



Perimeter = __________

$4^2+3^2=c^2$

$25=c^2$

$c=5$

$2+1+6+1+2+2+2=16$

$\sqrt{5}+5+2\sqrt{2}+5\sqrt{2}=17.14$

Approx: $16+17.14=$

$\boxed{33.14}$

$2^2+2^2=c^2$

$8=c^2$

$c=2\sqrt{2}$

$5^2+5^2=c^2$

$\sqrt{50}=\sqrt{c^2}$

$c=5\sqrt{2}$