Name _____ **Key** Date _____ **Key**
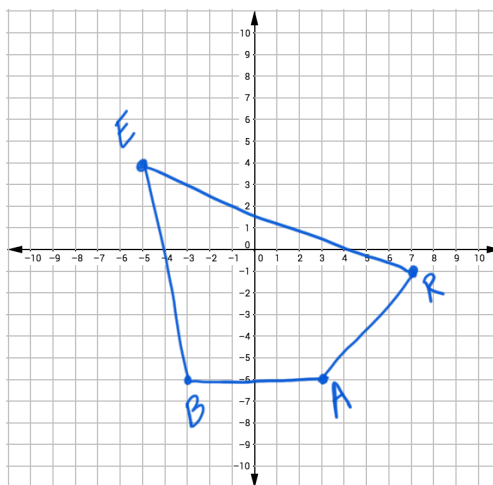
Introduction to Geometry
Introduction to Coordinate Geometry
Independent Practice

1. Given $R\,(7,-1), A(3,-6), B(-3,-6), E(-5,4)$, plot the points and trace the figure.

Part A: Determine the lengths of each side (round to the nearest hundredth).

$$RA = \sqrt{(7-3)^2 + (-1+6)^2} = \sqrt{41} \approx 6.40 \text{ units}$$
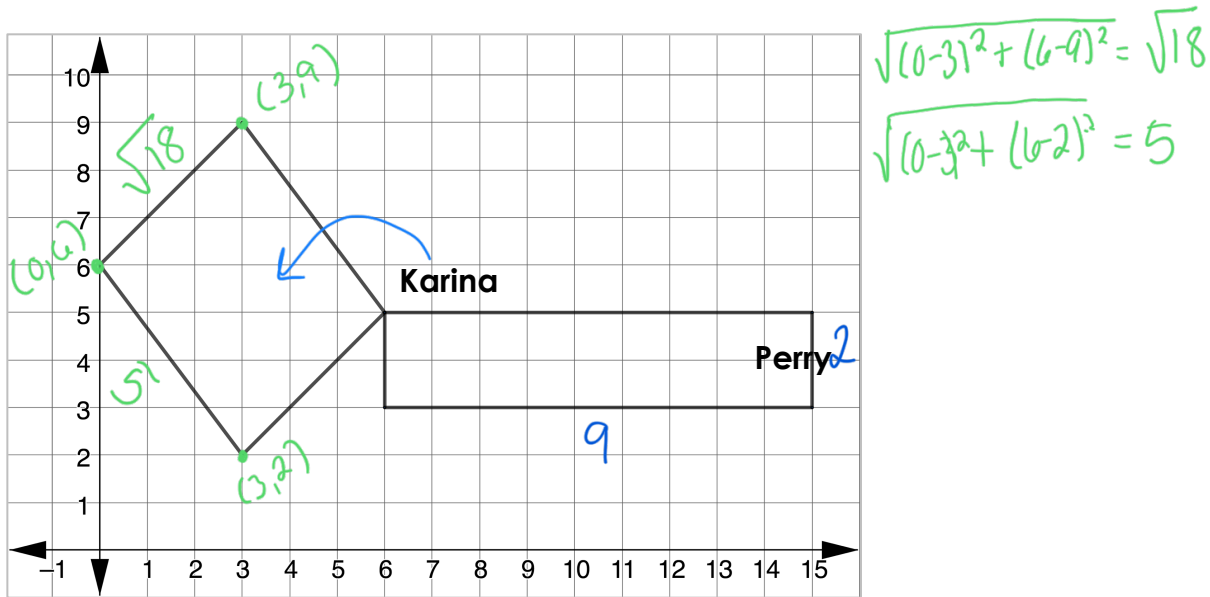
$$AB = 6 \text{ units}$$

$$BE = \sqrt{(-3+5)^2 + (-6-4)^2} = \sqrt{104} \approx 10.20 \text{ units}$$

$$ER = \sqrt{(-5-7)^2 + (4+1)^2} = \sqrt{169} = 13 \text{ units}$$

Part B: Determine the perimeter.

$$\text{perimeter} = 6.4 + 6 + 10.2 + 13$$
$$= 35.6 \text{ units}$$

2. Karina and Perry are cleaning up litter in the park for community service hours. Karina and Perry both claim they have covered the greatest area. Who is correct? Justify your answer using mathematical reasoning.

$\sqrt{(0-3)^2+(6-9)^2}=\sqrt{18}$

$\sqrt{(0-3)^2+(6-2)^2}=5$

(On graph, labels: $(3,9)$, $(0,6)$, $(3,2)$, $\sqrt{18}$, 5, **Karina**, **Perry** 2, 9)

$A_{perry}=2(9)=18 \text{ units}^2$

$A_{karina}=5(\sqrt{18})=21.2 \text{ units}^2$

Karina has covered the most area since her region has an area of 21.2 units² and Perry's has an area of 18 units².

3. $\triangle XYZ$ with vertices $X(1,5)$ and $Z(1,1)$ has an area of 10 units². What are the coordinates of the third vertex?

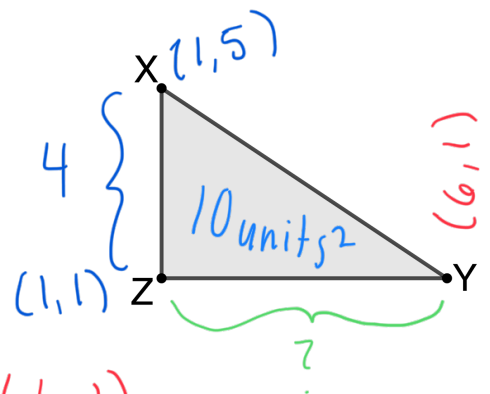$ZY=5$ units since area of a triangle $=\frac{1}{2}b\cdot h$.
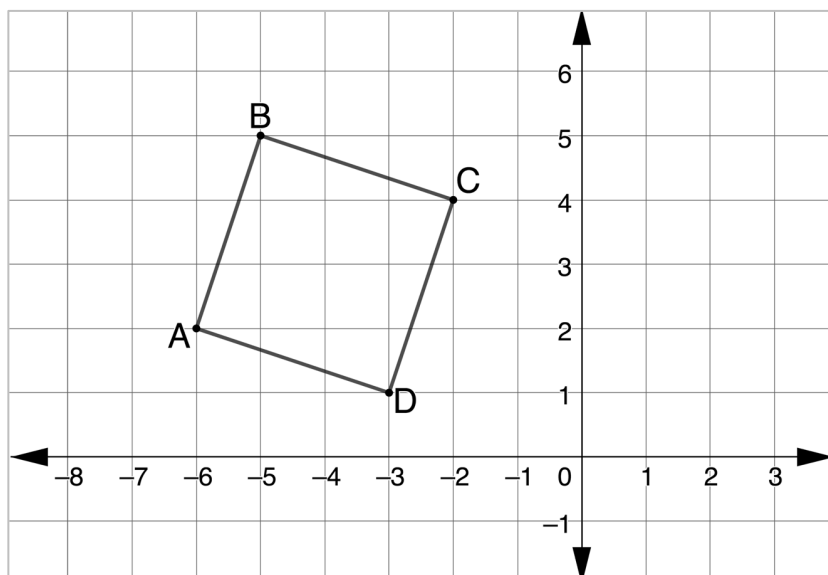
$h=4$

$10=\frac{1}{2}(b)(4)$

$b=5$

So, Y has coordinates $(6,1)$

(Diagram labels: $X(1,5)$, $(1,1)$ Z, Y, $(6,1)$, 4, 10 units², $?$)

4. Consider the diagram of quadrilateral $ABCD$.

$A(-6,2)$

$B(-5,5)$

$C(-2,4)$

$D(-3,1)$

Part A: Prove that $\overline{AB} \perp \overline{AD}$.

We are given $A(-6,2)$, $B(-5,5)$ and $D(-3,1)$.

The slope of line $AD = \frac{1-2}{-3+6} = \frac{-1}{3}$.

The slope of line $AB = \frac{2-5}{-6+5} = \frac{-3}{-1} = 3$.

Since $\overline{AB}$ and $\overline{AD}$ have slopes that are opposite reciprocals, $\overline{AB} \perp \overline{AD}$.

**Part B: Prove that $\overline{AD} \parallel \overline{BC}$.**

We are give $A(-6,2)$, $D(-3,1)$, $B(-5,5)$, and $C(-2,4)$.

From Part A, we know the slope of line $AD = -\frac{1}{3}$.

The slope of line $BC = \frac{5-4}{-5+2} = -\frac{1}{3}$. Since line

AD and line BC have the <u>same</u> slope, $\overline{AD} \parallel \overline{BC}$.

5. The local hardware store sells fencing for $1.30 per yard. If each unit on the grid represents 25 yards, how much will it cost to fence in the plot of land represented but polygon $MNOP$?

$M(-4,2)$

$N(1,4)$

$P(4,0)$

N 75yds O

134.75yds

100yds

M

206.25yds

P
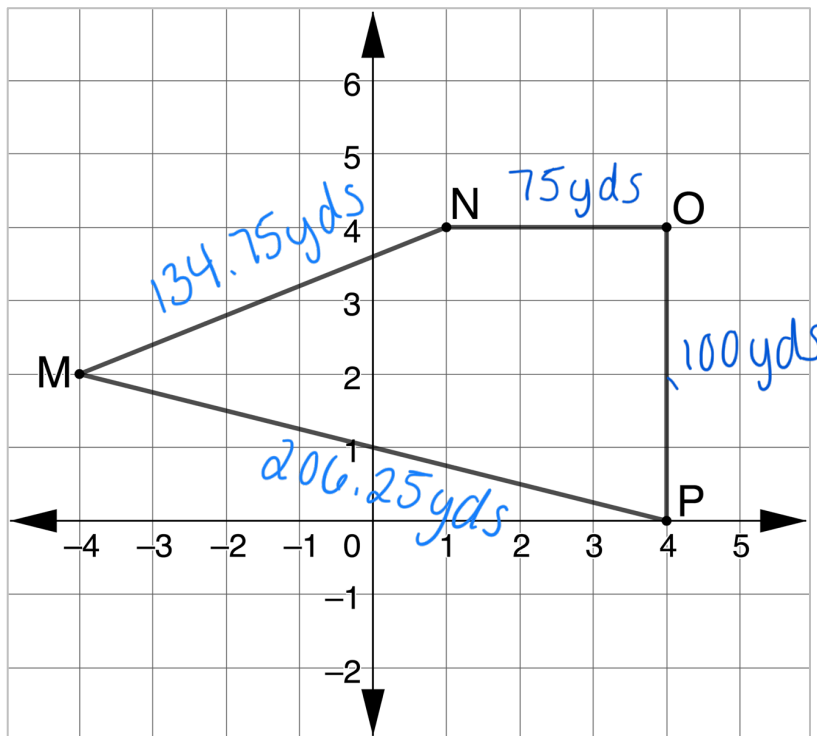
$MP = \sqrt{(-4-4)^2 + (2-0)^2} = \sqrt{68} \approx 8.25 \rightarrow 206.25 yds$

$MN = \sqrt{(-4-1)^2 + (2-4)^2} = \sqrt{29} \approx 5.39 \rightarrow 134.75 yds$

perimeter = 75 + 100 + 206.25 + 134.75

= 516 yards

cost = (516)(1.30) = $670.80