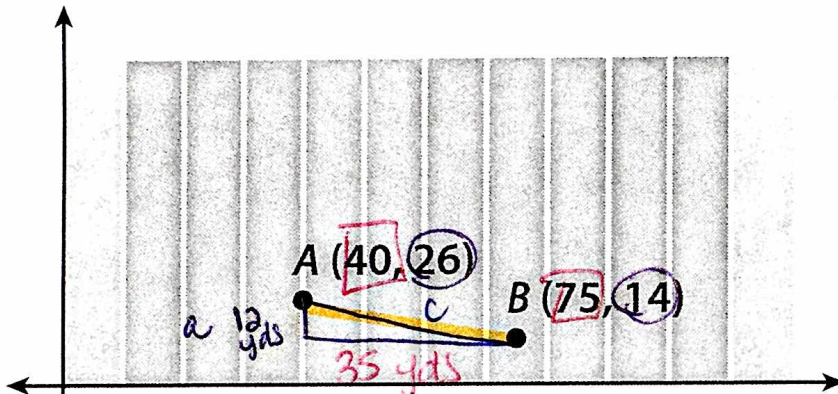


## Partner Practice: Determining the Distance between Two Points on a Coordinate Plane using the Pythagorean Theorem

1. The figure shows a representation of a football field. The units represent yards. A sports analyst marks the locations from where the football was thrown (Point A) to where it was caught (Point B). Explain how you can use the Pythagorean Theorem to find the distance the ball was thrown. Then find the distance.

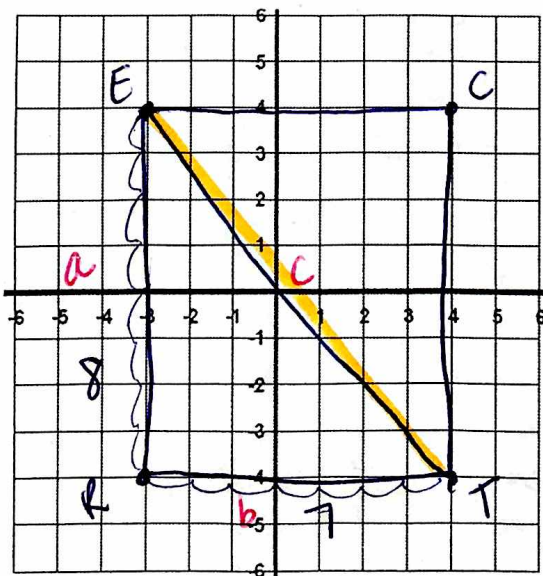


$A \rightarrow B$  is hypotenuse.  
 Draw right triangle.  
 Count length of legs.  
 Use  $a^2 + b^2 = c^2$  to find length of pass.

$$\begin{aligned}
 a &= 12 \\
 b &= 35 \\
 (12)^2 + (35)^2 &= c^2 \\
 144 + 1225 &= c^2 \\
 \sqrt{1369} &= \sqrt{c^2} \\
 37 &= c
 \end{aligned}$$

The pass was 37 yards.

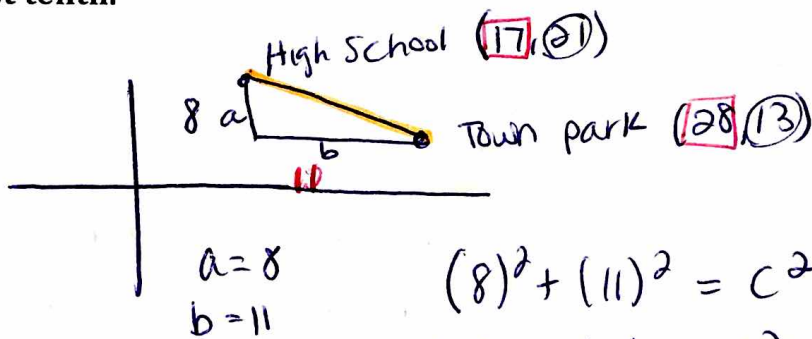
2. The coordinates of a rectangle are given by  $R(-3, -4)$ ,  $E(-3, 4)$ ,  $C(4, 4)$ , and  $T(4, -4)$ . Create the rectangle on the coordinate plane below. Then, connect points  $E$  and  $T$  to form diagonal  $ET$ . Find the exact length of  $ET$ .



$$\begin{aligned}
 a &= 8 \\
 b &= 7 \\
 (8)^2 + (7)^2 &= c^2 \\
 64 + 49 &= c^2 \\
 \sqrt{113} &= \sqrt{c^2} \\
 10.6 \text{ units} &= c
 \end{aligned}$$

ET is 10.6 units long.

3. When a coordinate grid is superimposed on a map of Harrisburg, the high school is located at (17, 21) and the town park is located at (28, 13). If each unit represents one mile, how many miles apart are the high school and the town park? Round your answer to the nearest tenth.



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

$$a = 8$$

$$b = 11$$

$$(8)^2 + (11)^2 = c^2$$

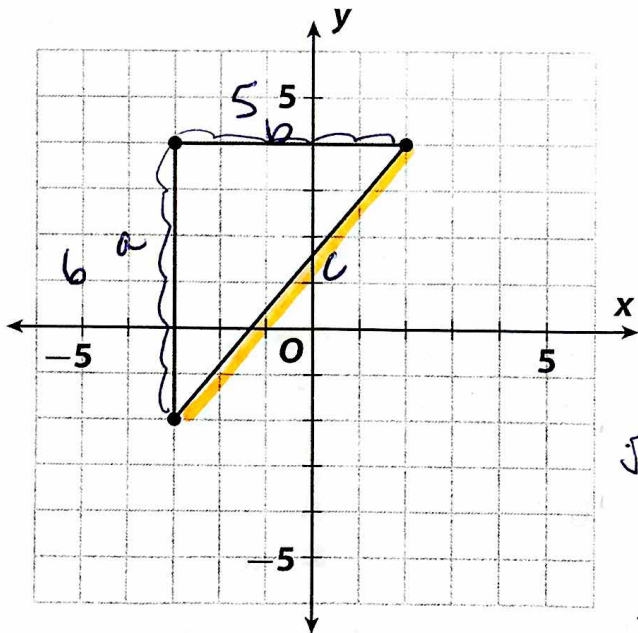
$$64 + 121 = c^2$$

$$\sqrt{185} = \sqrt{c^2}$$

$$13.6 \approx c$$

The school and park are  $\approx 13.6$  miles apart.

4. A metal worker traced a triangular piece of sheet metal on a coordinate plane, as shown below. The units represent inches. What is the length of the longest side of the metal triangle? Approximate the length to nearest tenth of an inch without using a calculator.



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

$$a = 5$$

$$b = 5$$

$$(5)^2 + (5)^2 = c^2$$

$$25 + 25 = c^2$$

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

$c \approx 7.8$  inches long

$$\sqrt{49}, \sqrt{61}, \sqrt{64}$$

$$7, \sqrt{61}, 8$$

$$7.5^2 = 56.25$$

$$7.6^2 = 57.76$$

$$7.7^2 = 59.29$$

$$7.8^2 = 60.84$$

$$7.9^2 = 62.41$$