Find the hypotenuse of the right triangle.

\[3^2 + 5^2 = x^2\]
\[9 + 25 = x^2\]
\[34 = x^2\]
\[\sqrt{34} = \sqrt{x^2}\]
\[5.83 = x\]

Find the hypotenuse of the triangle.

\[6^2 + 10^2 = x^2\]
\[36 + 100 = x^2\]
\[136 = x^2\]
\[\sqrt{136} = \sqrt{x^2}\]
\[2\sqrt{34} = x\]
\[11.66 = x\]
Find the missing side of the triangle.

\[ 4^2 + 8^2 = x^2 \]
\[ 16 + 64 = x^2 \]
\[ 80 = x^2 \]
\[ \sqrt{80} = \sqrt{x^2} \]
\[ 8.94 = x \]

Find the length of the line segment.
Find the distance between the two points.

\[ a^2 + b^2 = c^2 \]

\[ (y_2 - y_1)^2 + (x_2 - x_1)^2 = c^2 \]

Distance Formula

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

'd' (distance) is the 'c' in Pythagorean theorem. Could also see it as \( d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \), but order does not matter because of the commutative property \([a + b = b + a]\).
Using the Distance Formula

1. Input ordered pairs into the formula.

2. Simplify each term.

\[(y_2 - y_1)^2 = \___ \quad (x_2 - x_1)^2 = \___\]

3. Add numbers and take square root.

\[d = \sqrt{\___ + \___}\]

- Round two decimal places if needed
Find the distance between (-5,2) and (10,7).

\[ d = \sqrt{(y_2-y_1)^2 + (x_2-x_1)^2} \]
\[ d = \sqrt{(7-2)^2 + (10-(-5))^2} \]
\[ d = \sqrt{25 + 225} \]
\[ d = \sqrt{250} \]
\[ d = 15.81 \]

Find the distance between (3,2) and (-4,5).

\[ d = \sqrt{(y_2-y_1)^2 + (x_2-x_1)^2} \]
\[ d = \sqrt{(-5-2)^2 + (-4-3)^2} \]
\[ d = \sqrt{9 + 49} \]
\[ d = \sqrt{58} \]
\[ d = 7.62 \]
Find the perimeter of the triangle.

\[ AB : (-2, -5) (0, 3) \]
\[ d = \sqrt{(3 - (-2))^2 + (0 - (-5))^2} \]
\[ d = \sqrt{64 + 4} \quad d = 8.25 \]

\[ BC : (0, 3) (6, -3) \]
\[ d = \sqrt{(6 - 0)^2 + (-3 - 3)^2} \]
\[ d = \sqrt{36 + 36} \quad d = 8.49 \]

\[ CA : (6, -3) (-2, -5) \]
\[ d = \sqrt{((-5) - (-3))^2 + ((-2) - (6))^2} \]
\[ d = \sqrt{4 + 64} \quad d = 8.25 \]

\[ 8.25 + 8.49 + 8.25 = \boxed{24.99} \]