**Learning Objective:** We will use the Pythagorean Theorem to determine the distance between two points on the coordinate plane. (G8M7L11)

**Activating Prior Knowledge:**
We can use the Pythagorean Theorem to find the length of missing sides of a right triangle.

**Concept Development:**
If we had a coordinate plane, could we use the Pythagorean Theorem somehow to help us find the distance of the hypotenuse of a right triangle? How??

**The Distance Formula:**
\[ \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2} = c \]
Guided Practice:

Steps for Finding the Distance Between 2 Points on the Coordinate Plane
1. Draw a right triangle, using the given diagonal length as your hypotenuse.
2. Use the Pythagorean Theorem \((a^2 + b^2 = c^2)\) to determine the length of the hypotenuse.
3. Estimate the hypotenuse to the nearest tenth of a unit.

Find the distance between A and B.

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

\[ AB \approx 12.8 \]

Find the distance between A and B.

\[ AB = \sqrt{34} \]

\[ AB \approx 5.8 \]

Find the distance between A and B.

\[ AB = \sqrt{74} \]

\[ AB \approx 8.6 \]

Find the distance between A and B.

\[ a^2 + 13^2 = AB^2 \]

\[ AB^2 = 233 \]

\[ AB = \sqrt{233} \]

\[ AB \approx 15.3 \]
Is the triangle formed by the 3 points a right triangle? Prove with Pythagorean Theorem.

\[ \sqrt{12^2 + 4^2} = 13 \]

\[ \sqrt{12^2 + 1^2} = 13 \]

**Closure:**

Is this a right triangle? How do you know?
INDEPENDENT PRACTICE:

Find the Distance between the two points.

Find the distance between the two points.

Find this a right triangle? Why or why not? Prove with Pythagorean Theorem.
Notes: Lesson 17, Module 7 Grade 8