

12.3 Distance Between Two Points

Essential Question: How can you use the Pythagorean Theorem to find the distance between two points on a coordinate plane?

Learning Goal: **Students will be able to apply the Pythagorean Theorem to find the distance between two points in a coordinate system. MAFS.8.G.2.8**

Questions:

Notes:

Finding the Distance Between Any Two Points

The Pythagorean Theorem can be used to find the distance between any two points (X_1, Y_1) and (X_2, Y_2) in the coordinate plane. The resulting expression is called the Distance Formula.

Distance Formula

In a coordinate plane, the distance d between two points (X_1, Y_1) and (X_2, Y_2) is

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

Find the distance between the two points $E(-9, 5)$ and $F(-4, 0)$.

→ Use the distance formula.

$$\begin{aligned} \rightarrow d &= \sqrt{(-4 + 9)^2 + (0 - 5)^2} \\ &= \sqrt{5^2 + (-5)^2} = 5\sqrt{2} \end{aligned}$$