

## Distance Formula Guided Lesson Explanation

1. We are working with the end points: (2, 8) and (-4, 6)

To find the distance, we would simply use the distance formula:

$$\begin{aligned}d &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \\d &= \sqrt{((-4) - 2)^2 + (6 - 8)^2} \\d &= \sqrt{(-6)^2 + (-2)^2} \\d &= \sqrt{36 + 4} \\d &= \sqrt{40} \\d &= 6.32\end{aligned}$$

2a. Although this question is worded differently, it is asking us basically the same thing that the last question asked. We are working with the end points: (12, 5) and (-6, 2).

$$\begin{aligned}d &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \\d &= \sqrt{((-6) - 12)^2 + (2 - 5)^2} \\d &= \sqrt{(-18)^2 + (-3)^2} \\d &= \sqrt{324 + 9} \\d &= \sqrt{333} \\d &= 18.25\end{aligned}$$

2b. The halfway point between the two end points can be represented by:  $(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})$ . We are working with the end points: (12, 5) and (-6, 2).

$$(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}) = (\frac{12 + (-6)}{2}, \frac{5 + 2}{2}) = (3, 3.5) \text{ would be the midpoint.}$$