

# The Midpoint Formula

$$M\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$$

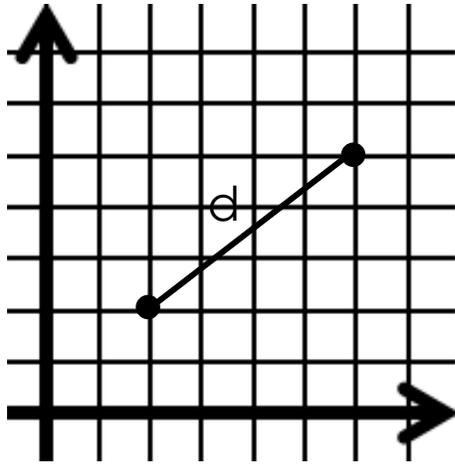
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Used to find the distance between two points on the coordinate plane.



### Example 1:

Find the distance between  $(-3, 1)$  and  $(2, 3)$ .

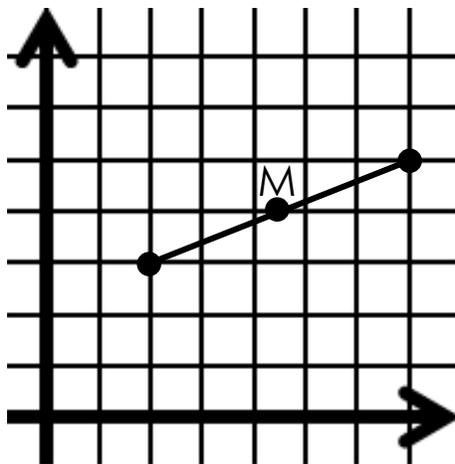
### Example 2:

Find the distance between  $(-2, 1)$  and  $(2, 5)$ .

## The Midpoint Formula

$$M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

The midpoint of a line segment is the point on the segment that is equidistant from the endpoints.



**Example 3:** Find the midpoint of the line segment with endpoints  $(-3, -1)$  and  $(7, -5)$ .

**Example 4:** Find the midpoint of the line segment with endpoints  $(6, -3)$  and  $(4, -7)$ .

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Answer Key!

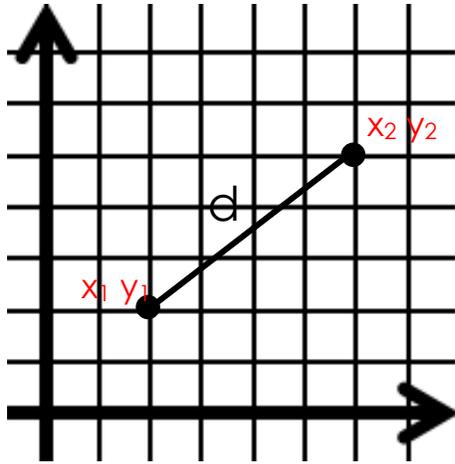
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## Example 1:

Find the distance between  $(-3, 1)$  and  $(2, 3)$ .

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

$$d = \sqrt{(2 + 3)^2 + (3 - 1)^2}$$

$$d = \sqrt{(5)^2 + (2)^2}$$

$$d = \sqrt{25 + 4}$$

$$d = \sqrt{29}$$

## Example 2:

Find the distance between  $(-2, 1)$  and  $(2, 5)$ .

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

$$d = \sqrt{(2 + 2)^2 + (5 - 1)^2}$$

$$d = \sqrt{(4)^2 + (4)^2}$$

$$d = \sqrt{16 + 16}$$

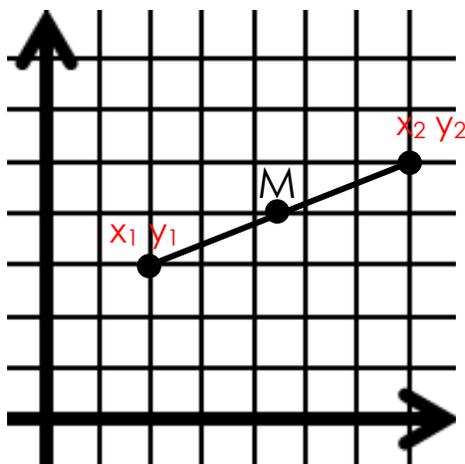
$$d = \sqrt{32}$$

$$d = \sqrt{16} \cdot \sqrt{2} = 4\sqrt{2}$$

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$$M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

The midpoint of a line segment is the point on the segment that is equidistant from the endpoints.



**Example 3:** Find the midpoint of the line segment with endpoints  $(-3, -1)$  and  $(7, -5)$ .

$$M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

$$= M\left(\frac{-3 + 7}{2}, \frac{-1 + (-5)}{2}\right)$$

$$= M\left(\frac{4}{2}, \frac{-6}{2}\right)$$

$$= M(2, -3)$$

**Example 4:** Find the midpoint of the line segment with endpoints  $(6, -3)$  and  $(4, -7)$ .

$$M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

$$= M\left(\frac{6 + 4}{2}, \frac{-3 + (-7)}{2}\right)$$

$$= M\left(\frac{10}{2}, \frac{-10}{2}\right)$$

$$= M(5, -5)$$

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Directions:

Print Pages 1 & 2 front to back (flip along the short edge). The print should be facing in opposite directions. Fold both ends in so they meet at the thick black line in the center.

The final product should look like this:

