Distance and Midpoint

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What are Distance and Midpoint?

Distance is the measure between two points.

Midpoint is the middle point of a line segment.

To find distance and midpoint, we will use a formula.

Distance and Midpoint Formulas

Distance Formula:

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

Midpoint Formula:

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

How to Find Distance

Find the distance between the points, (4, 8) and (5, 9)

x_1 y_1 x_2 y_2

1) Label the coordinates
2) Use the distance formula and plug in the numbers

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

$$d = \sqrt{(5 - 4)^2 + (9 - 8)^2}$$

$$d = \sqrt{1^2 + 1^2}$$

$$d = \sqrt{2}$$

3) Solve the equation
4) Plug radical 2 into the calculator and you'll get your answer

d= 1.414

How to Find Midpoint

Find the midpoint between the points, (3, 7) and (6, 13)

x_1 y_1 x_2 y_2

1) Label the coordinates
2) Use the midpoint formula and plug in the numbers

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

$$m = \left(\frac{3 + 6}{2}, \frac{7 + 13}{2} \right)$$

3) Solve the equation

$$m = \left(\frac{3 + 6}{2}, \frac{7 + 13}{2} \right)$$

$$m = \left(\frac{9}{2}, \frac{20}{2} \right)$$

M = (4.5, 10)

Practice Questions

For questions 1-2, find the distance

1) (6, 15) (8, 23)

2) (2, 5) (4, 7)

For questions 3-4, find the midpoint

3) (1, 12) (4, 16)

4) (7, 10) (9, 14)

Answer Key

1) d= 8.25

2) d= 2.83

3) m= (2.5, 14)

4) m= (8, 12)