

## Distance Formula Midpoint Formula Worksheet Answer Key PDF

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### Part 1: Building a Foundation

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**What is the formula for calculating the distance between two points  $(x_1, y_1)$  and  $(x_2, y_2)$  in a coordinate plane?**

undefined.  $(x_2 - x_1) + (y_2 - y_1)$

undefined.  $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$  ✓

undefined.  $(x_2 + x_1) / 2, (y_2 + y_1) / 2$

undefined.  $(x_2 - x_1)^2 + (y_2 - y_1)^2$

The correct formula is the one that uses the square root of the sum of the squares of the differences in coordinates.

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undefined.  $(x_2 - x_1)^2 + (y_2 - y_1)^2$

The distance formula is given by  $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ .

**Which of the following statements are true about the midpoint formula?**

undefined. **It finds the center point of a line segment.** ✓

undefined. It is used to calculate the distance between two points.

undefined. **The formula is  $((x_1 + x_2) / 2, (y_1 + y_2) / 2)$ .** ✓

undefined. It is derived from the Pythagorean theorem.

The midpoint formula is used to find the center point of a line segment and is derived from averaging the coordinates.

**Which of the following statements are true about the midpoint formula?**

**undefined. It finds the center point of a line segment. ✓**

undefined. It is used to calculate the distance between two points.

**undefined. The formula is  $(x_1 + x_2) / 2, (y_1 + y_2) / 2$ . ✓**

undefined. It is derived from the Pythagorean theorem.

The midpoint formula finds the center point of a line segment.

**Explain how the distance formula is related to the Pythagorean theorem.**

**The distance formula is derived from the Pythagorean theorem, which relates the lengths of the sides of a right triangle.**

**Explain how the distance formula is related to the Pythagorean theorem.**

**The distance formula is derived from the Pythagorean theorem, which relates the lengths of the sides of a right triangle to the distance between two points.**

**List the components needed to use the distance formula.**

1. What are the coordinates of the first point?

**$(x_1, y_1)$**

2. What are the coordinates of the second point?

**$(x_2, y_2)$**

You need the coordinates of the two points in the coordinate plane.

## Part 2: comprehension and Application

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**When using the distance formula, which of the following must be true?**

undefined. The points must be on the same axis.

undefined. The coordinates must be integers.

**undefined. The formula can be used in any coordinate plane. ✓**

**undefined. The result is always a positive number. ✓**

The distance formula can be applied in any coordinate plane, and the result is always a positive number.

**When using the distance formula, which of the following must be true?**

undefined. The points must be on the same axis.

undefined. The coordinates must be integers.

**undefined. The formula can be used in any coordinate plane. ✓**

**undefined. The result is always a positive number. ✓**

The formula can be used in any coordinate plane.

**Describe a real-world scenario where you might use the midpoint formula.**

**The midpoint formula can be used in various scenarios, such as finding the center of a park or the average location of two landmarks.**

**Describe a real-world scenario where you might use the midpoint formula.**

**The midpoint formula can be used in various scenarios, such as finding the center of a park.**

**If the coordinates of two points are  $(3, 4)$  and  $(7, 8)$ , what is the distance between them?**

undefined. 5

**undefined. 6 ✓**

undefined. 7

undefined. 8

The distance can be calculated using the distance formula, resulting in a specific numerical value.

**If the coordinates of two points are  $(3, 4)$  and  $(7, 8)$ , what is the distance between them?**

**undefined. 5 ✓**

undefined. 6

undefined. 7

undefined. 8

The distance between the points is 5.

**Given points  $(2, 3)$  and  $(4, 7)$ , which of the following are correct calculations for the midpoint?**

**undefined.  $(3, 5)$  ✓**

undefined.  $(2, 5)$

undefined.  $(3, 7)$

undefined.  $(4, 3)$

The correct midpoint can be found by averaging the x-coordinates and the y-coordinates of the two points.

**Given points  $(2, 3)$  and  $(4, 7)$ , which of the following are correct calculations for the midpoint?**

**undefined.  $(3, 5)$  ✓**

undefined.  $(2, 5)$

undefined.  $(3, 7)$

undefined.  $(4, 3)$

The correct midpoint calculations are  $(3, 5)$ .

**Calculate the distance between the points  $(1, 2)$  and  $(4, 6)$  and explain each step.**

**The distance can be calculated step by step using the distance formula, explaining each calculation.**

**Calculate the distance between the points  $(1, 2)$  and  $(4, 6)$  and explain each step.**

**The distance is calculated using the distance formula, step by step.**

### Part 3: Analysis, Evaluation, and Creation

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**If the midpoint of a line segment is  $(5, 6)$  and one endpoint is  $(3, 4)$ , what are the coordinates of the other endpoint?**

**undefined.  $(7, 8)$  ✓**

undefined.  $(6, 7)$

undefined. (8, 10)

undefined. (4, 5)

The other endpoint can be calculated by rearranging the midpoint formula.

**If the midpoint of a line segment is (5, 6) and one endpoint is (3, 4), what are the coordinates of the other endpoint?**

**undefined. (7, 8) ✓**

undefined. (6, 7)

undefined. (8, 10)

undefined. (4, 5)

The other endpoint is (7, 8).

**Which of the following scenarios would require using both the distance and midpoint formulas?**

undefined. Finding the center of a circular garden.

undefined. Calculating the length of a fence.

**undefined. Determining the shortest path between two cities. ✓**

**undefined. Locating the center of a rectangular field. ✓**

Scenarios that involve finding both the distance and the midpoint will require both formulas.

**Which of the following scenarios would require using both the distance and midpoint formulas?**

undefined. Finding the center of a circular garden.

undefined. Calculating the length of a fence.

**undefined. Determining the shortest path between two cities. ✓**

**undefined. Locating the center of a rectangular field. ✓**

Finding the center of a rectangular field requires both formulas.

**Analyze how changing one coordinate of a point affects the distance between two points.**

**Changing one coordinate will affect the distance based on how far the point moves in relation to the other point.**

**Analyze how changing one coordinate of a point affects the distance between two points.**

### Changing a coordinate affects the calculated distance based on the distance formula.

**Which of the following best evaluates the importance of the distance formula in navigation?**

undefined. It helps in calculating fuel efficiency.

**undefined. It is used to determine the shortest route. ✓**

undefined. It provides exact coordinates for locations.

undefined. It assists in weather prediction.

The distance formula is crucial for determining the shortest route in navigation.

**Which of the following best evaluates the importance of the distance formula in navigation?**

undefined. It helps in calculating fuel efficiency.

**undefined. It is used to determine the shortest route. ✓**

undefined. It provides exact coordinates for locations.

undefined. It assists in weather prediction.

The distance formula is crucial for determining the shortest route.

**Imagine you are designing a new city park. Which of the following tasks would require the use of the midpoint formula?**

**undefined. Placing benches equidistant from each other. ✓**

undefined. Designating a circular walking path.

**undefined. Position a fountain at the center of the park. ✓**

undefined. Calculating the area of a rectangular playground.

Tasks that involve finding a central point or equidistant placement will require the midpoint formula.

**Imagine you are designing a new city park. Which of the following tasks would require the use of the midpoint formula?**

**undefined. Placing benches equidistant from each other. ✓**

undefined. Designing a circular walking path.

**undefined. Positioning a fountain at the center of the park. ✓**

undefined. Calculating the area of a rectangular playground.

Placing benches equidistant from each other requires the midpoint formula.

**Propose a method for using the distance formula to create a map for a hiking trail, ensuring equal spacing between rest stops. Include your reasoning and any assumptions made.**

**A method could involve calculating distances between points along the trail and ensuring they are evenly spaced based on the distance formula.**

**Propose a method for using the distance formula to create a map for a hiking trail, ensuring equal spacing between rest stops. Include your reasoning and any assumptions made.**

**Using the distance formula can help in planning equal distances between rest stops.**