

The Distance Formula Worksheet Questions and Answers PDF

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Part 1: Building a Foundation

What is the primary purpose of the Distance Formula?

Hint: Think about what the formula calculates.

- To calculate the area of a triangle
- To find the distance between two points in a coordinate plane ✓
- To determine the slope of a line
- To measure the angle between two lines

The primary purpose of the Distance Formula is to find the distance between two points in a coordinate plane.

Which of the following are components of the Distance Formula?

Hint: Consider the elements that make up the formula.

- Square root ✓
- Coordinates of two points ✓
- Slope of a line
- Squaring operation ✓

The components of the Distance Formula include the square root, coordinates of two points, and the squaring operation.

Explain how the Distance Formula is derived from the Pythagorean theorem.

Hint: Think about the relationship between the sides of a right triangle.

The Distance Formula is derived from the Pythagorean theorem by considering the distance between two points as the hypotenuse of a right triangle formed by the differences in their coordinates.

List the axes of a coordinate plane and describe their orientation.

Hint: Consider the two main lines that define the plane.

1. What is the x-axis?

The x-axis is the horizontal line in a coordinate plane.

2. What is the y-axis?

The y-axis is the vertical line in a coordinate plane.

The axes of a coordinate plane are the x-axis (horizontal) and the y-axis (vertical).

Part 2: Comprehension and Application

In the Distance Formula $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$, what does d represent?

Hint: Consider what the formula calculates.

- The midpoint between two points
- The distance between two points ✓
- The slope of the line connecting two points
- The angle between two lines

In the Distance Formula, d represents the distance between two points.

Which of the following statements about the coordinate plane are true?

Hint: Think about the definitions of the axes and points.

- The x-axis is vertical
- The y-axis is horizontal
- Points are expressed as ordered pairs (x, y) ✓
- The origin is where the x-axis and y-axis intersect ✓

The true statements about the coordinate plane include that the x-axis is horizontal, the y-axis is vertical, points are expressed as ordered pairs, and the origin is where the axes intersect.

Calculate the distance between the points $(2, -3)$ and $(-1, 5)$ using the Distance Formula. Show your work.

Hint: Use the formula and substitute the coordinates.

To calculate the distance, substitute the coordinates into the Distance Formula and simplify to find the distance.

If the coordinates of two points are $(3, 4)$ and $(7, 1)$, what is the distance between them?

Hint: Use the Distance Formula to find the answer.

- 5
- 6 ✓
- 7
- 8

The distance between the points $(3, 4)$ and $(7, 1)$ can be calculated using the Distance Formula.

Part 3: Analysis, Evaluation, and Creation

Which part of the Distance Formula ensures that the distance is always a positive value?

Hint: Consider the operations involved in the formula.

- Subtraction of coordinates
- Squaring of differences ✓**
- Addition of squares
- Square root operation

■ The squaring of differences ensures that the distance is always a positive value.

When analyzing the Distance Formula, which mathematical operations are involved?

Hint: Think about the steps taken in the formula.

- Addition ✓**
- Subtraction ✓**
- Multiplication
- Division

■ The mathematical operations involved in the Distance Formula include addition, subtraction, and squaring.

Analyze how changing the coordinates of one point affects the calculated distance. Provide an example to illustrate your explanation.

Hint: Consider how distance varies with different coordinates.

■ **Changing the coordinates of one point affects the calculated distance by altering the differences in the x and y values, which can increase or decrease the distance.**

Which of the following best evaluates the importance of the Distance Formula in geometry?

Hint: Think about its applications and relevance.

- It is only useful for simple calculations
- It is essential for determining distances in coordinate geometry ✓**
- It is rarely used in practical applications
- It is primarily used for theoretical purposes

| The Distance Formula is essential for determining distances in coordinate geometry.

Imagine you are designing a game that involves moving characters on a grid. How could the Distance Formula be used in your game design?

Hint: Consider the movement mechanics of characters.

- To calculate the shortest path between two characters ✓**
- To determine the area covered by a character
- To find the distance a character can move in one turn ✓**
- To measure the distance between a character and an obstacle ✓**

| The Distance Formula could be used to calculate the shortest path between characters, determine movement limits, and measure distances to obstacles.

Create a real-world problem that involves finding the distance between two points. Provide a solution using the Distance Formula.

Hint: Think of a scenario where distance is relevant.

| A real-world problem could involve finding the distance between two locations on a map, and the solution would involve applying the Distance Formula to the coordinates of those locations.