Worksheet Distance Formula

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Part 1: Building a Foundation

What is the formula for calculating the distance between two points in a coordinate plane?

Hint: Think about the Pythagorean Theorem.

- ◯ A) d = (x_2 - x_1) + (y_2 - y_1)
- ◯ B) d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}
- ◯ C) d = (x_2 + x_1)^2 + (y_2 + y_1)^2
- ◯ D) d = \sqrt{(x_2 + x_1)^2 + (y_2 + y_1)^2}

Which of the following statements are true about the Distance Formula?

Hint: Consider the properties and applications of the formula.

- ☐ A) It is derived from the Pythagorean Theorem.
- ☐ B) It can only be used in two-dimensional space.
- ☐ C) It calculates the distance between two points.
- ☐ D) It requires the coordinates of the points.

Explain how the Distance Formula is related to the Pythagorean Theorem.

Hint: Think about how the formula is derived.

List the steps involved in calculating the distance between two points using the Distance Formula.

Hint: Think about the order of operations.

1. Step 1: Identify the coordinates of the two points.

2. Step 2: Calculate the differences in x and y coordinates.

3. Step 3: Square the differences.

4. Step 4: Sum the squared differences.

5. Step 5: Take the square root of the sum.

Part 2: Understanding and Interpretation

In the coordinate plane, what do the variables x1, y1, x2, y2 represent in the Distance Formula?

Hint: Consider the meaning of coordinates.

- ◯ A) The angles of a triangle
- ◯ B) The coordinates of two points
- ◯ C) The midpoints of a line segment
- ◯ D) The slopes of a line

Why is it important to correctly identify the coordinates of points when using the Distance Formula?

Hint: Think about the consequences of incorrect coordinates.

- ☐ A) To ensure accurate calculation of distance
- ☐ B) To determine the direction of the line segment
- ☐ C) To avoid errors in squaring differences
- ☐ D) To find the midpoint of the segment

Describe a real-world scenario where the Distance Formula might be used.

Hint: Think about situations involving distance measurement.

Part 3: Application and Analysis

If point A is at (3, 4) and point B is at (7, 1), what is the distance between these two points?

Hint: Use the Distance Formula to calculate.

- ◯ A) 5
- ◯ B) 6
- ◯ C) 7
- ◯ D) 8

Which of the following are correct steps to solve for the distance between points (2, 3) and (5, 7)?

Hint: Think about the order of operations in the Distance Formula.

- ☐ A) Calculate (5 - 2)^2
- ☐ B) Calculate (7 - 3)^2
- ☐ C) Add the results of the squared differences
- ☐ D) Take the square root of the sum

Given the points (1, 2) and (4, 6), calculate the distance between them and explain each step.

Hint: Use the Distance Formula and describe your process.

How does changing the coordinates of one point affect the distance calculated using the Distance Formula?

Hint: Consider the impact of coordinate changes.

- ◯ A) It does not affect the distance.
- ◯ B) It only affects the distance if both points are changed.
- ◯ C) It can increase or decrease the distance.
- ◯ D) It always increases the distance.

Discuss how the Distance Formula can be used to verify if three points form a right triangle.

Hint: Think about the properties of right triangles.

Part 4: Evaluation and Creation

Which of the following best evaluates the effectiveness of using the Distance Formula in a three-dimensional space?

Hint: Consider how the formula can be adapted.

- ◯ A) It is not effective because it only works in two dimensions.
- ◯ B) It can be adapted by adding a z-coordinate component.
- ◯ C) It is effective without any changes.
- ◯ D) It requires converting to polar coordinates.

Create a scenario where calculating the distance between points is crucial. Which of the following elements would you include?

Hint: Think about practical applications of distance measurement.

- ☐ A) A map with coordinates
- ☐ B) A need to find the shortest path
- ☐ C) Coordinates of various landmarks

- [ ] D) A comparison of distances between multiple points

Design a real-world problem that involves using the Distance Formula, and explain how you would solve it.

Hint: Think about practical applications of the formula.