Distance Formula Worksheet

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Part 1: Building a Foundation

What is the distance formula used to calculate the distance between two points \((x_1, y_1)\) and \((x_2, y_2)\) in a plane?

Hint: Consider the formula that involves squaring the differences of the coordinates.

- ◯ 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 are components of the distance formula?

Hint: Think about the operations involved in the formula.

- ☐ A) Subtraction of coordinates
- ☐ B) Addition of coordinates
- ☐ C) Squaring of differences
- ☐ D) Taking the square root

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

Hint: Consider how the distance formula is derived from the theorem.

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

Hint: Think about the order of operations needed.

1. Step 1

2. Step 2

3. Step 3

4. Step 4

5. Step 5

Part 2: Understanding and Interpretation

If the points \((3, 4)\) and \((7, 1)\) are plotted on a graph, what is the first step in using the distance formula to find the distance between them?

Hint: Consider the operations needed to find the differences in coordinates.

- ◯ A) Add the x-coordinates
- ◯ B) Subtract the y-coordinates
- ◯ C) Subtract the x-coordinates
- ◯ D) Add the y-coordinates

Which statements correctly describe the purpose of the distance formula?

Hint: Think about what the distance formula is used for.

- ☐ A) To find the midpoint between two points
- ☐ B) To calculate the length of a line segment
- ☐ C) To determine the slope of a line
- ☐ D) To measure the straight-line distance between two points

Describe a real-world scenario where the distance formula might be used.

Hint: Think about situations involving navigation or mapping.

Part 3: Application and Analysis

Calculate the distance between the points \((2, -3)\) and \((5, 4)\).

Hint: Use the distance formula to find the answer.

- ◯ A) 5
- ◯ B) 7
- ◯ C) 8
- ◯ D) 10

Given the points \((1, 2)\) and \((4, 6)\), which of the following calculations are correct steps in finding the distance?

Hint: Identify the calculations that follow the distance formula.

- ☐ A) \((4 - 1)^2\)
- ☐ B) \((6 - 2)^2\)
- ☐ C) \(\sqrt{9 + 16}\)
- ☐ D) \(\sqrt{3 + 4}\)

A drone flies from point \((0, 0)\) to point \((8, 6)\). Use the distance formula to determine how far the drone has traveled.

Hint: Apply the distance formula to find the answer.

What is the effect of changing one coordinate of a point on the distance between two points?

Hint: Consider how distance is affected by coordinate changes.

- ◯ A) The distance remains the same
- ◯ B) The distance always increases
- ◯ C) The distance always decreases
- ◯ D) The distance may increase or decrease

Part 4: Evaluation and Creation

If the distance between two points is zero, what can be concluded about the points?

Hint: Think about the implications of zero distance.

- ◯ A) They are on the same line
- ◯ B) They are the same point
- ◯ C) They are equidistant from the origin
- ◯ D) They are at opposite ends of a diameter

Evaluate the following scenarios. In which cases would the distance formula be applicable?

Hint: Consider situations where distance measurement is relevant.

- ☐ A) Measuring the length of a shadow
- ☐ B) Calculating the distance between two cities on a map
- ☐ C) Determining the height of a building
- ☐ D) Finding the shortest path between two points

Create a real-world problem that involves using the distance formula, and provide a solution to the problem.

Hint: Think about a scenario that requires distance calculation.