Distance Formula Worksheet Questions and Answers PDF

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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}

> The correct answer is B) 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 ✓**

> The correct answers are A) Subtraction of coordinates, C) Squaring of differences, and 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.

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 in a coordinate plane.

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

Identify the coordinates of the points.

2. Step 2

Subtract the x-coordinates and y-coordinates.

3. Step 3

Square the results.

4. Step 4

Add the squared results.

5. Step 5

> Take the square root of the sum.

> The steps include: 1) Identify the coordinates of the points, 2) Subtract the x-coordinates and y-coordinates, 3) Square the results, 4) Add the squared results, 5) Take the square root of the sum.

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

> The correct answer is C) Subtract the x-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 ✓**

> The correct answers are B) To calculate the length of a line segment and 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.

A real-world scenario could involve calculating the distance between two locations on a map, such as finding the distance between two cities.

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

The correct answer is B) 7.

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) \(\sqrt{3 + 4}\)

The correct answers are A) \((4 - 1)^2\), B) \((6 - 2)^2\), and C) \(\sqrt{9 + 16}\).

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.

The distance traveled by the drone is 10 units, calculated using the distance formula.

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 ✓**

The correct answer is 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

The correct answer is B) They are the same point.

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

- [x] **D) Finding the shortest path between two points ✓**

> The correct answers are B) Calculating the distance between two cities on a map and 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.

> **An example problem could involve calculating the distance between two locations for a delivery service, with a solution showing the application of the distance formula.**