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Dilation Worksheet

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Part 1: Building a Foundation

What is the definition of dilation in geometry?

Hint: Think about how dilation affects the size of a figure.

○ A) A transformation that changes the shape of a figure
○ B) A transformation that changes the size of a figure
○ C) A transformation that changes the position of a figure
○ D) A transformation that changes the orientation of a figure

Which of the following are properties of dilation? (Select all that apply)

Hint: Consider the characteristics that remain unchanged during dilation.

☐ A) Proportionality
☐ B) Change in angle measures
☐ C) Preservation of orientation
☐ D) Change in shape

Explain what is meant by the "center of dilation" and its role in the transformation process.

Hint: Consider where the dilation originates from.

List the effects of dilation on the following geometric properties:

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Hint: Think about how each property is affected by dilation.

1. Lines

2. Angles

3. Circles

Part 2: Understanding and Interpretation

If a scale factor is greater than 1, what type of dilation occurs?

Hint: Consider what happens to the size of the figure.

◯ A) Reduction
◯ B) Enlargement
◯ C) Translation
◯ D) Reflection

Which statements about scale factors are true? (Select all that apply)

Hint: Think about how scale factors affect size.

☐ A) A scale factor of 1 means no change in size.
☐ B) A scale factor less than 1 results in an enlargement.
☐ C) A scale factor greater than 1 results in a reduction.
☐ D) A scale factor of 0.5 results in a reduction.

Describe how dilation affects the coordinates of a point when the center of dilation is the origin.

Hint: Consider how the coordinates change based on the scale factor.

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Part 3: Application and Analysis

A triangle with vertices at (2, 3), (4, 5), and (6, 7) is dilated with a scale factor of 2 from the origin. What are the coordinates of the new vertices?

Hint: Multiply each coordinate by the scale factor.

○ A) (4, 6), (8, 10), (12, 14)
○ B) (1, 1.5), (2, 2.5), (3, 3.5)
○ C) (3, 4), (5, 6), (7, 8)
○ D) (0, 0), (0, 0), (0, 0)

Which of the following transformations can be considered a dilation? (Select all that apply)

Hint: Think about transformations that change size.

☐ A) Enlargening a photograph
☐ B) Rotating a figure 90 degrees
☐ C) Shrinking a map
☐ D) Reflecting a shape over the x-axis

Given a rectangle with vertices at (1, 2), (1, 6), (5, 6), and (5, 2), apply a dilation with a scale factor of 0.5 centered at the origin. Provide the new coordinates.

Hint: Multiply each coordinate by the scale factor.

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Which of the following statements is true about the relationship between original figures and their dilated images?

Hint: Consider the properties of similarity.

○ A) The dilated image is always smaller than the original.

○ B) The dilated image is always larger than the original.

○ C) The dilated image is similar to the original.

○ D) The dilated image is congruent to the original.

Analyze the effects of dilation on a line segment. Which of the following are true? (Select all that apply)

Hint: Think about how dilation affects the properties of line segments.

☐ A) The line segment remains parallel to its original position.

☐ B) The length of the line segment changes proportionally.

☐ C) The orientation of the line segment changes.

☐ D) The endpoints of the line segment remain fixed.

Discuss how dilation can be used to demonstrate similarity between two geometric figures.

Hint: Consider the properties that define similarity.

Part 4: Evaluation and Creation

Which scenario best illustrates the use of dilation in real-world applications?

Hint: Think about practical uses of dilation.

○ A) Calculating the area of a triangle

○ B) Designing a scale model of a building

○ C) Measuring the angles of a polygon

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○ D) Reflectinging a shape over the y-axis

Evaluate the following scenarios and identify which involve dilation. (Select all that apply)

Hint: Consider transformations that change size.

☐ A) Enlargening a blueprint for construction
☐ B) Rotating a wheel
☐ C) Shrinking a digital image for web use
☐ D) Translating a point along a vector

Create a real-world problem that involves dilation and provide a step-by-step solution to solve it.

Hint: Think about a scenario where size changes are important.

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