

Dilation Worksheet Questions and Answers PDF

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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

█ Dilation is a transformation that changes the size 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

█ Properties of dilation include proportionality and preservation of orientation.

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

Hint: Consider where the dilation originates from.

The center of dilation is the fixed point from which the figure is enlarged or reduced.

List the effects of dilation on the following geometric properties:

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

1. Lines

Lines remain straight and parallel.

2. Angles

Angles remain unchanged.

3. Circles

Circles increase or decrease in radius.

Dilation affects lines, angles, and circles in specific ways.

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

■ A scale factor greater than 1 results in an enlargement.

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. ✓

■ True statements include that a scale factor of 1 means no change and 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.

■ When the center of dilation is the origin, the coordinates are multiplied by the scale factor.

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)

■ The new vertices after dilation are (4, 6), (8, 10), and (12, 14).

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

■ Enlargement and shrinking are examples of dilation.

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.

■ The new coordinates after dilation are (0.5, 1), (0.5, 3), (2.5, 3), and (2.5, 1).

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.

The dilated image is similar to the original figure.

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.

Dilation affects the length and orientation of line segments.

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

Hint: Consider the properties that define similarity.

Dilation shows that two figures are similar by maintaining proportionality in their corresponding sides.

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
- D) Reflecting a shape over the y-axis

Designs for scale models often utilize dilation to represent larger structures accurately.

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

Enlargement of blueprints and shrinking of images are examples of dilation.

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.

A real-world problem could involve resizing a map for navigation.