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Dilations Worksheet

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Part 1: Building a Foundation

What is the center of dilation in a geometric transformation?

Hint: Think about the point around which the figure changes size.

○ The point where the figure is rotated
○ The fixed point around which the figure is enlarged or reduced
○ The midpoint of the figure
○ The point where the figure is reflected

Which of the following statements are true about dilations? (Select all that apply)

Hint: Consider the properties of dilations and their effects on figures.

☐ Dilations change the shape of a figure.
☐ Dilations can enlarge or reduce a figure.
☐ Dilations preserve the angles of a figure.
☐ Dilations always have a scale factor greater than 1.

Explain what a scale factor is and how it affects a dilation.

Hint: Consider how the scale factor changes the size of the figure.

List the properties of dilations that remain unchanged after the transformation.

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Hint: Think about the characteristics of the figure that do not change.

1. What properties remain unchanged?

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Part 2: Understanding and Interpretation

If a triangle is dilated with a scale factor of 0.5, what happens to the size of the triangle?

Hint: Consider how the scale factor affects the dimensions of the triangle.

○ It doubles in size.
○ It remains the same size.
○ It reduces to half its original size.
○ It becomes four times larger.

Which of the following are effects of a dilation with a scale factor less than 1? (Select all that apply)

Hint: Think about how a smaller scale factor affects the figure.

☐ The figure is enlarged.
☐ The figure is reduced.
☐ The angles of the figure change.
☐ The orientation of the figure is preserved.

Describe how the center of dilation influences the resulting image of a figure.

Hint: Consider the position of the center relative to the figure.

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Part 3: Application and Analysis

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A rectangle is dilated by a scale factor of 3 with the center of dilation at one of its vertices. What is the effect on the rectangle?

Hint: Think about how the scale factor and center of dilation interact.

○ The rectangle is reduced to one-third its size.
○ The rectangle is unchanged.
○ The rectangle is enlarged three times its original size.
○ The rectangle is rotated.

Which real-world scenarios can involve the use of dilations? (Select all that apply)

Hint: Consider practical applications of dilations in everyday life.

☐ Resizing a photograph
☐ Constructuring a scale model of a building
☐ Rotating a wheel
☐ Mapping a city layout

Provide an example of how dilations are used in creating maps and explain the importance of scale factor in this context.

Hint: Think about how maps represent real-world distances.

Part 4: Evaluation and Creation

When a figure is dilated with a scale factor of 2 from a center point outside the figure, what happens to the distances between points on the figure?

Hint: Consider how dilation affects distances in relation to the center.

○ Distances are halved.
○ Distances remain the same.
○ Distances are doubled.

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○ Distances are quadrupled.

Analyzing a dilation, which of the following statements are correct? (Select all that apply)

Hint: Think about the properties of the image and pre-image.

☐ The image and pre-image are congruent.
☐ The image is similar to the pre-image.
☐ The scale factor determines the degree of enlargement or reduction.
☐ The dilation changes the orientation of the figure.

Analyze how changing the center of dilation affects the resulting image of a geometric figure.

Hint: Consider the implications of the center's position.

Which scenario best demonstrates the concept of dilation in art?

Hint: Think about artistic techniques that involve scaling.

○ Drawing a portrait
○ Creating a perspective drawing with vanishing points
○ Sketchin a landscape
○ Painting a mural

Evaluate the following statements about dilations and select those that reflect their significance in mathematics. (Select all that apply)

Hint: Consider the role of dilations in mathematical concepts.

☐ Dilations are crucial for understanding similarity.
☐ Dilations have no practical applications.
☐ Dilations help in resizing objects proportionally.
☐ Dilations distort the original figure.

Design a real-world problem where dilation is used to solve a practical issue. Explain the problem and how dilation provides a solution.

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Hint: Think about scenarios where scaling is necessary.

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