

Grade 4 Math Worksheet: **Symmetry & Reflections** : Difficulty Level - Advance

**Name:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Instructions:** Complete each question carefully. Use a ruler and protractor when necessary. Show your working clearly and answer in the spaces provided.

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**Part 1: Lines of Symmetry in Complex Shapes**

**1. Identify the Lines of Symmetry**

Draw the shape and indicate all its lines of symmetry:

- Regular hexagon: \_\_\_\_\_
- Isosceles trapezoid: \_\_\_\_\_
- Regular octagon: \_\_\_\_\_

**2. Multiple Choice: Lines of Symmetry**

Choose the correct option for each question:

a) How many lines of symmetry does a rhombus have?

- (1) 0
- (2) 1
- (3) 2
- (4) 4

3. b) How many lines of symmetry does an equilateral triangle have?

- (1) 1
  - (2) 2
  - (3) 3
  - (4) 6
- 

**Part 2: Reflections and Rotations**

**3. Reflect and Rotate the Shape**

Draw the shape below. Then, reflect it across the y-axis. After that, rotate it 180

degrees.

[Shape: A rectangle with a small triangle on top]

4. **Reflection of a Complex Shape**

Reflect the following complex shape over the line  $y = x$ . Draw both the original and the reflected shapes clearly.

[Shape: A square with an equilateral triangle attached to one corner]

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**Part 3: Symmetry in Letters, Numbers, and Words**

5. **Identify Symmetry in Words**

For each word below, check if it has vertical symmetry, horizontal symmetry, or both. Write your answer:

- MADAM: \_\_\_\_\_
- AHA: \_\_\_\_\_
- NOON: \_\_\_\_\_
- CIVIC: \_\_\_\_\_

6. **Write a Symmetrical Word**

Create a word that has both vertical and horizontal symmetry. Write your word here: \_\_\_\_\_

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**Part 4: Symmetry in 3D Shapes**

7. **Planes of Symmetry in 3D Shapes**

Draw and label the planes of symmetry for the following 3D shapes:

- Sphere: \_\_\_\_\_
- Rectangular Prism: \_\_\_\_\_
- Square Pyramid: \_\_\_\_\_

8. **Match the 3D Shape to its Symmetry**

Match each 3D shape to the correct number of planes of symmetry:

Shape	Number of Symmetry Planes
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Cube                    A. 2

Cone                    B. Infinite

Sphere                C. 1

Rectangular  
Prism                  D. 4

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### Part 5: Symmetry and Coordinate Geometry

#### 9. Reflection in the Coordinate Plane

Reflect the point (3, 4) over the x-axis. What are the new coordinates?

**Answer:** \_\_\_\_\_

Reflect the point (3, 4) over the y-axis. What are the new coordinates?

**Answer:** \_\_\_\_\_

#### 10. Midpoint and Symmetry

The midpoint of a line segment is at (4, 5). One endpoint is at (2, 3). What are the coordinates of the other endpoint?

**Answer:** \_\_\_\_\_

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### Part 6: Symmetry in Patterns and Art

#### 11. Create a Symmetrical Pattern

Create a pattern using at least two different shapes (triangles, squares, circles, etc.) that has both vertical and horizontal symmetry. Draw your pattern below.

[Space to draw]

#### 12. Symmetry in Nature

Describe how symmetry is used in the design of a flower (for example, how

petals are arranged). Draw the symmetrical pattern of a flower below.  
[Space to draw flower with symmetrical petals]

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### Part 7: Real-World Applications of Symmetry

#### 13. Symmetry in Architecture

Research a famous building (e.g., Taj Mahal, Eiffel Tower). Draw its symmetrical features and explain how symmetry is used in its design.

**Building/Structure:** \_\_\_\_\_

**Symmetrical Features:** \_\_\_\_\_

**Explanation:** \_\_\_\_\_

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### Part 8: Symmetry in 3D Reflections

#### 14. Reflection of 3D Objects

Imagine you are looking at a rectangular box in front of a mirror. Describe how the reflection of the box would appear in the mirror. Would it change? Why or why not?

**Answer:** \_\_\_\_\_

#### 15. Symmetry in a Reflection of a Cube

If you reflect a cube over a vertical mirror line, how many symmetrical parts of the cube will be visible in the reflection?

**Answer:** \_\_\_\_\_

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### Part 9: Symmetry Puzzle

#### 16. Complete the Puzzle

The following figure is only half of a shape. Complete the reflection of the shape to make it symmetrical.

[Shape: A complex geometric pattern like half a star or flower]

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**Well done! Review your answers, check your work, and share your designs and findings with your teacher.**

## Symmetry & Reflections Worksheet (Advanced Level 4)

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Rectangular Prism D. 4

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**— BE CHAMPION —**