

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

Name: _____

Date: _____

Instructions: Complete the following questions. Use a ruler and compass where needed for accurate drawings.

Part 1: Analyzing Symmetry in Complex Shapes

1. Identify the Lines of Symmetry

For each of the following shapes, draw and label all the lines of symmetry:

- Regular decagon (10-sided polygon)
- Parallelogram
- Isosceles triangle with a slanted base

2. Multiple Choice: Symmetry of 3D Shapes

Choose the correct option for each shape:

a) A cube has how many lines of symmetry?

- (1) 3
- (2) 4
- (3) 9
- (4) Infinite

3. b) A sphere has how many lines of symmetry?

- (1) 1
- (2) 0
- (3) Infinite
- (4) 6

4. c) A cylinder has how many lines of symmetry along its height?

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

Part 2: Advanced Reflection and Rotation

3. Reflect and Rotate

Draw the shape below and its reflection over the vertical line. Then, rotate the shape 90 degrees clockwise.

! [Simple geometric shape like a star or triangle next to a vertical line]

4. Double Reflection Challenge

Reflect the following shape first across a vertical line and then across a horizontal line. Draw each step carefully.

! [A complex shape, like a parallelogram or hexagon, positioned near two mirror lines]

Part 3: Symmetry in Letters and Words

5. Symmetry in Words

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

- LEVEL: _____
- RADAR: _____
- EYE: _____
- DEIFIED: _____

6. Create Symmetrical Words

Create a word that has vertical symmetry and write it down. Ensure the word only uses letters with vertical symmetry.

Your word: _____

7. Symmetry and Palindromes

A palindrome is a word that reads the same forward and backward (like "WOW").

Does each of the following palindromes have symmetry? Write **Yes** or **No**:

- MOM: _____
 - ROTOR: _____
 - MADAM: _____
-

Part 4: Symmetry in Art and Nature

8. Draw the Reflection

Draw half of an animal (like a butterfly or fish) in the space below. Then, reflect it across a vertical line to complete the animal.

[Space to draw half of an animal]

9. Nature and Symmetry

Think of two examples from nature where symmetry plays an important role (e.g., flower petals, animal faces). Write about these examples below and explain why symmetry is important in these cases.

Example 1: _____

Explanation: _____

Example 2: _____

Explanation: _____

Part 5: Symmetry Puzzles

10. Complete the Reflection Puzzle

Complete the reflection of the following complex shape. Ensure the right side mirrors the left side correctly.

! [A complex puzzle piece with half of a pattern drawn]

11. Symmetry and Coordinates

Consider a point at coordinates (2, 3). If this point is reflected across the x-axis, what are the new coordinates?

Answer: _____

If the same point is reflected across the y-axis, what are the new coordinates?

Answer: _____

Part 6: Creative Design

12. Symmetrical Design Challenge

Create a design using a combination of shapes (triangles, squares, circles, etc.) that has both vertical and horizontal symmetry. Draw the design below.

[Large space for drawing]

13. Symmetry in Architecture

Think about the buildings or landmarks you have seen. Choose one and describe how symmetry is used in its design.

Building/Landmark: _____

How Symmetry is Used: _____

Excellent work! Review your answers and share your creative designs with your classmates or teacher.

— BE CHAMPION—