

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

Here's another advanced-level worksheet for Grade 4 students on "**Symmetry & Reflections**".

Symmetry & Reflections Worksheet (Advanced Level 3)

Name: _____ **Date:** _____

Instructions: Complete each section carefully. Use a ruler, compass, or protractor when necessary. Show all work clearly.

Part 1: Identifying and Drawing Lines of Symmetry

1. Identify Lines of Symmetry

For each shape listed below, draw all lines of symmetry. Write the number of lines of symmetry each shape has:

- Regular pentagon: _____
- Rectangle: _____
- Kite: _____
- Equilateral triangle: _____

2. Complex Shape Symmetry

Draw and label all lines of symmetry for the following shape:

- A symmetrical butterfly (half is shown)

3. [Space for drawing]

Part 2: Reflections and Rotations

3. Reflect the Shape Across the X-Axis and Y-Axis

Reflect the given shape first over the x-axis and then over the y-axis. Draw both

reflections.

[Space to draw shape and axes]

4. **Rotation Reflection Challenge**

Rotate the following shape 90 degrees clockwise. Then, reflect it over a vertical line. Draw both steps clearly.

[Shape: e.g., square with one corner missing or a simple polygon]

Part 3: Symmetry in Letters, Numbers, and Words

5. **Identify Symmetry in Letters**

Write **Symmetrical** or **Not Symmetrical** next to each letter or number, depending on whether it has vertical or horizontal symmetry:

- P: _____
- H: _____
- 9: _____
- S: _____
- Q: _____
- 4: _____

6. **Symmetry and Palindromes**

A palindrome is a word that is the same forwards and backwards. Check the words below and write if they have symmetry (i.e., if they are palindromes). If yes, write the line(s) of symmetry.

- RADAR: _____
- REFER: _____
- DEIFIED: _____
- LEVEL: _____

7. **Create a Symmetrical Word**

Create a word using only letters that have vertical symmetry. Write your word here: _____

Part 4: Symmetry in 3D Shapes

8. **3D Shape Symmetry**

Consider the following 3D shapes and draw the possible planes of symmetry:

- Cube: _____
- Sphere: _____

- Cone: _____

9. Matching Symmetry of 3D Shapes

Match each 3D shape with its correct number of planes of symmetry:

| Shape | Number of Symmetry Planes |
|-------|------------------------------|
|-------|------------------------------|

| | |
|------|------|
| Cube | A. 1 |
|------|------|

| | |
|--------|------|
| Sphere | B. 4 |
|--------|------|

| | |
|----------|-------------|
| Cylinder | C. Infinite |
|----------|-------------|

| | |
|------|------|
| Cone | D. 2 |
|------|------|

Part 5: Symmetry and Patterns

10. Create a Symmetrical Pattern

Using shapes like squares, triangles, and circles, create a pattern that has two lines of symmetry (one vertical and one horizontal). Draw your pattern below.

[Large box for drawing]

11. Symmetry in Nature

Choose an object in nature that has symmetry, like a leaf, flower, or animal. Draw the object and show its line(s) of symmetry. Label your drawing.

[Space to draw]

Part 6: Complex Symmetry Problems

12. Find the Symmetry of the Following Shape

This shape has been rotated. Identify the number of lines of symmetry it has and draw the lines of symmetry.

[Shape: A rotated and skewed version of a square or rectangle]

13. Symmetry Puzzle

The following figure has one line of symmetry. Complete the reflection of the figure across the line of symmetry.

[Puzzle shape with half of the pattern drawn]

Part 7: Symmetry in Real-Life Architecture

14. Symmetry in Famous Buildings

Look at the image of the building below. Identify and describe the symmetry used in its design. Draw the lines of symmetry you can find in the building's structure.

[Image of a famous building, like the Taj Mahal or the Eiffel Tower]

Part 8: Creative Reflection and Symmetry

15. Design a Symmetrical Logo

Design a logo or symbol that has at least two lines of symmetry. Draw your design below and show the lines of symmetry.

[Space to draw]

16. Symmetry in Mirrors

Imagine you are standing in front of a mirror. Describe how your reflection would look in the mirror. How does the mirror create symmetry?

Explanation: _____

Great work! Review your answers, double-check your drawings, and share your designs with your class or teacher.

— BE CHAMPION —