Fun with Symmetry

Standard difficulty · 20 questions · 40 marks · Time: 54 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. How many lines of symmetry does a rectangle (not a square) have?

(a) 4 **(b)** 2 **(c)** 6 **(d)** 3

2. Which capital letter looks the same in a mirror held beside it (a standing line of symmetry)?

(a) M **(b)** N **(c)** Z **(d)** L

3. Which digit looks the same in a mirror held beside it?

(a) 3 **(b)** 5 **(c)** 2 **(d)** 8

4. Does the number 68 look the same when you see it in a mirror held beside it?

(a) Only if it is upside down **(b)** Yes
(c) Only the first digit does **(d)** No

5. A line that folds a shape into two matching halves is a:

(a) perimeter **(b)** diameter only
(c) line of symmetry **(d)** right angle

6. Can equal triangles cover the floor of a verandah with no gaps and no overlaps?

(a) Only in a round room **(b)** Yes
(c) No, there will be gaps **(d)** Only if they overlap

7. Does the word TAT look exactly the same in a mirror held beside it?

(a) Only in capital letters **(b)** No
(c) Only the first letter **(d)** Yes

8. A paper is folded in half twice, and 4 holes are punched through all the layers. How many holes are there when it is opened out?

(a) 16 **(b)** 17 **(c)** 20 **(d)** 12

Section B — Short answer — 8 × 2 = 16 marks

9. How many lines of symmetry does a square handkerchief have?

10. Which of these letters have a standing (vertical) line of symmetry? H, B, E, D, C

11. Which digit goes in the box so that 8818□ looks the same in a mirror held beside it?

12. Write the word YOUTH as it looks in a mirror held beside it (letters in reverse order).

13. Can circles tile the floor of a school courtyard without gaps? Explain.

14. A paper is folded in half and 14 holes are punched through both layers. How many holes are there when it is opened?

15. Does 101 look the same in a mirror held beside it?

16. A paper is folded in half once and 7 holes are cut through all the layers. How many holes are there when it is opened?

Section C — Word problems — 4 × 4 = 16 marks

17. Write how many lines of symmetry each shape has: a rectangular notebook cover, an equilateral triangle, a rectangular door.

18. Which of these numbers look the same in a mirror held beside them: 818, 88, 181, 607? Explain the rule.

19. Which of these words look the same in a mirror held beside them: OTTO, AHA, BOOK, CAT?

20. A floor is to be tiled. Will circles work? Will regular hexagons work? What does “no gaps and no overlaps” mean?

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Answer key

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Q	Answer	Working
1	**(b) 2**	—
2	**(a) M**	—
3	**(d) 8**	only 0, 1 and 8 do
4	**(d) No**	a mirror flips the order and each digit; it must use only 0, 1, 8 and read the same backwards
5	**(c) line of symmetry**	—
6	**(b) Yes**	—
7	**(d) Yes**	every letter is symmetrical and the word reads the same backwards
8	**(a) 16**	4 layers × 4
9	**4**	—
10	**H**	—
11	**8**	it must read the same backwards, so the box matches the digit before the middle
12	**HTUOY**	these letters are symmetrical, so only the order changes
13	**No, circles leave gaps between them.**	—
14	**28**	each hole goes through both halves
15	**Yes**	only 0, 1 and 8, and it reads the same backwards
16	**14**	2 layers each get 7 holes
17	**a rectangular notebook cover: 2; an equilateral triangle: 3; a rectangular door: 2**	—
18	**818, 88, 181; the digits must be 0, 1 or 8 and the number must read the same backwards**	—
19	**OTTO, AHA**	every letter must be symmetrical and the word must read the same backwards
20	**Circles: no; regular hexagons: yes. The tiles must cover the whole floor, and no tile may lie on another.**	—