Symmetrical Designs

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. Which capital letter has a line of symmetry going straight up and down?

(a) L **(b)** G **(c)** S **(d)** H

2. Which capital letter has a line of symmetry going across?

(a) Y **(b)** J **(c)** W **(d)** X

3. Which capital letter looks the same after a half turn?

(a) T **(b)** L **(c)** D **(d)** H

4. How many lines of symmetry does a parallelogram (no right angles) have?

(a) 2 **(b)** 1 **(c)** 0 **(d)** 4

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

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

6. Which of these letter strings looks exactly the same in a mirror stood beside it?

(a) ZUUV **(b)** ATTA **(c)** HUUHY **(d)** JWWU

7. Does a kite look the same after a quarter turn?

(a) Only if it is coloured **(b)** Only after a one-eighth turn
(c) No **(d)** Yes

8. Which number looks the same after a half turn (turn the page upside down)?

(a) 800 **(b)** 863 **(c)** 986 **(d)** 300

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

9. Write the letters in WINDOW that have an up-and-down line of symmetry.

10. How many lines of symmetry does a regular shape with 10 sides have?

11. Which of these letters have both an up-and-down and an across line of symmetry: V, P, W, R, I, X, M?

12. Write the first number after 785 that looks the same after a half turn.

13. How many letters of KITE look the same after a half turn?

14. What is the total number of lines of symmetry of a rhombus (not a square), a parallelogram (no right angles) and the plus sign +?

15. Does UUMUU look exactly the same in a mirror stood beside it? Answer yes or no.

16. How many letters of KITE have an across line of symmetry?

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

17. Sort these letters: I, A, B, E, U, T, O, Q. (a) Up-and-down line only. (b) Across line only. (c) Both lines. (d) No line of symmetry.

18. For each shape, write the number of lines of symmetry and whether it looks the same after a half turn: (a) a regular octagon (b) a regular pentagon (c) an isosceles triangle.

19. Write the name TARA in capital letters. (a) Which of its letters have an up-and-down line of symmetry? (b) Which have an across line? (c) Which look the same after a half turn?

20. (a) Does 809 look the same after a half turn? (b) What is the next number after 809 that does? (c) Write all such numbers from 900 to 999.

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Answer key

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Q	Answer	Working
1	**(d) H**	fold it down the middle and the two halves match
2	**(d) X**	fold it across the middle and the top matches the bottom
3	**(d) H**	turn the page upside down and it reads the same
4	**(c) 0**	—
5	**(b) line of symmetry**	—
6	**(b) ATTA**	every letter must have an up-and-down line, and the string must read the same both ways
7	**(c) No**	—
8	**(c) 986**	0, 1 and 8 stay the same; 6 and 9 swap
9	**W, I, O**	letters with an up-and-down line: A H I M O T U V W X Y
10	**10**	a regular shape has as many lines of symmetry as sides
11	**I, X**	only H, I, O and X have both
12	**808**	use only 0, 1, 8, 6 and 9, with 6 and 9 swapping
13	**1**	half-turn letters: H I N O S X Z; in KITE: I
14	**6**	2 + 0 + 4
15	**Yes**	every letter needs an up-and-down line, and the string must read the same both ways
16	**3**	across-line letters: B C D E H I K O X
17	**(a) A, U, T; (b) B, E; (c) I, O; (d) Q**	—
18	**(a) 8, yes; (b) 5, no; (c) 1, no**	—
19	**(a) T, A; (b) none; (c) none**	—
20	**(a) No; (b) 818; (c) 906, 916, 986**	0, 1, 8 stay the same and 6, 9 swap; the number also reads backwards

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