

WA5MMGTW1

Two-dimensional space and structures

Core + Challenge

NAPLAN-style

Line Symmetry — Marking Key

I can find all the lines of symmetry of a shape and complete a shape or pattern in a mirror line.

For tutors and parents. Award method marks for correct working even if the final answer is wrong.

Marks summary

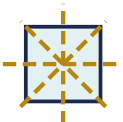
A Warm up: 16 B Practise: 21 C Think it through: 10 D Challenge: 9 **Total: 56**

Gold shading in this key shows what the child should have shaded or drawn. Accept any correct arrangement unless the question fixes it.

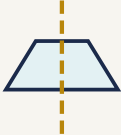
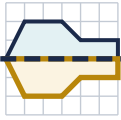
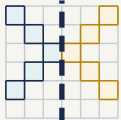
A

Warm up *answers*

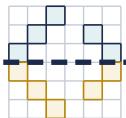
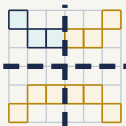
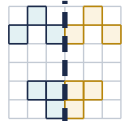
/ 16 marks

Q	Answer	Model answer / notes	Marks
1	4 lines	 Two lines join the middles of opposite sides; two are the diagonals.	1
2	3 lines	 One line from each corner to the middle of the opposite side.	1
3	1 line	 Only the line through the top and bottom corners.	1
4	0 lines	 No lines. Folding along a diagonal does not match (see Think it through 1).	1
5	6 lines	 Three lines through opposite corners and three through the middles of opposite sides.	1

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Q	Answer	Model answer / notes	Marks
6	4 lines	 Two lines through opposite points and two through the gaps between them.	1
7	1 line	 One vertical line through the middles of the two parallel sides.	1
8	5 lines	 One line from each corner to the middle of the opposite side.	1
9	Shape completed	 Each corner is the same number of squares from the line, on the other side.	1
10	Shape completed	 Horizontal mirror line: the new half is below the line.	1
11	Shape completed	 Diagonal line: a corner 4 squares up the left edge goes 4 squares along the bottom.	1
12	Shape completed	 The shape does not touch the line, so its image does not either.	1
13	5 squares shaded	 Each shaded square gets a partner the same distance on the other side of the line.	1

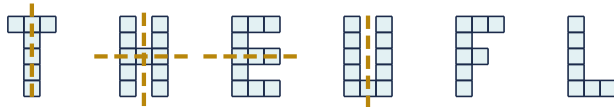
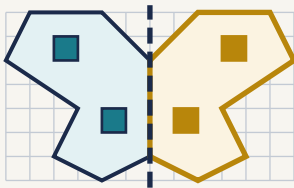
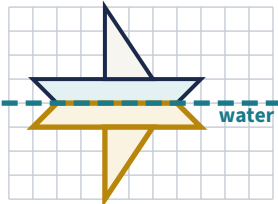
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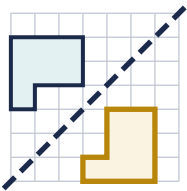
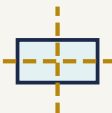
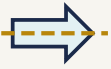
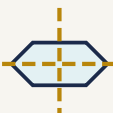
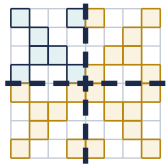
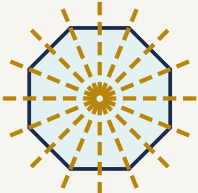
Q	Answer	Model answer / notes	Marks
14	5 squares shaded	 Reflect each square in the horizontal line.	1
15	9 squares shaded	 Reflect in the vertical line, then reflect everything in the horizontal line: 9 more squares.	1
16	6 squares shaded	 Squares next to the line have partners next to the line.	1

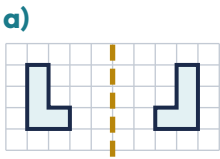
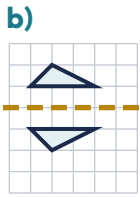
B

Practise *answers and working*

/ 21 marks

Q	Answer	Working / sample response	Marks
1	T 1, H 2, E 1, U 1; circle F and L	 T and U: 1 vertical line. E: 1 horizontal line. H: 2 lines (vertical and horizontal). F and L have no lines of symmetry, so they are circled. <i>2 marks: lines correct on all four symmetrical letters (1 mark for three). 1 mark: circles F and L only.</i>	3
2	Butterfly completed	 Each corner of the wing is the same number of squares from the line, on the right side. Each spot is shaded the same distance from the line on the other side. <i>1 mark: outline of the wing correct. 1 mark: both spots correct.</i>	2
3	Reflection drawn upside down	 The reflection is upside down, below the water line. The hull touches the line, so its reflection touches the line too. The top of the sail (4 squares up) goes 4 squares down. <i>1 mark: hull reflected correctly. 1 mark: sail reflected correctly.</i>	2

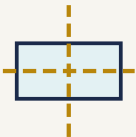
Q	Answer	Working / sample response	Marks								
4	Flag reflected	 Each corner moves straight across the diagonal to the same distance on the other side. The tall flag becomes a wide flag lying along the bottom edge of the grid, below the mirror line. <i>3 marks: all corners correct. 2 marks: one corner wrong. 1 mark: correct size and shape but in the wrong place.</i>	3								
5	See table	A  B  C  D  E  F  <table border="1" style="margin-top: 10px; width: 100%; text-align: center;"> <thead> <tr> <th>0 lines</th><th>1 line</th><th>2 lines</th><th>more than 2</th></tr> </thead> <tbody> <tr> <td>C, E</td><td>B</td><td>A, F</td><td>D</td></tr> </tbody> </table> 0 lines: C and E. 1 line: B. 2 lines: A and F. More than 2: D (4 lines). <i>3 marks: all six correct. 2 marks: four or five. 1 mark: two or three.</i>	0 lines	1 line	2 lines	more than 2	C, E	B	A, F	D	3
0 lines	1 line	2 lines	more than 2								
C, E	B	A, F	D								
6	21 more squares shaded	 Reflect the top-left part in the vertical line (top right). Then reflect the whole top half in the horizontal line (bottom half). The finished design has 28 shaded squares. <i>1 mark: top right correct. 1 mark: bottom left correct. 1 mark: bottom right correct.</i>	3								
7	8 lines	 4 lines go through opposite corners. 4 lines go through the middles of opposite sides. $4 + 4 = 8$. <i>1 mark: 8. 1 mark: all 8 lines drawn.</i>	2								
8	C	A and D have 1 line each. B (regular hexagon) has 6 lines. C has 2 lines: one across and one up through the middle. <i>1 mark: C.</i>	1								

Q	Answer	Working / sample response	Marks
9	a) vertical line b) horizontal line	  a) The line is straight up and down, halfway between the shapes: 5 squares from the left edge. b) The line goes across, halfway between the triangles: 4 squares up from the bottom. <i>1 mark for each mirror line in the correct place.</i>	2

C

Think it through *sample answers and criteria*

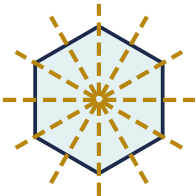
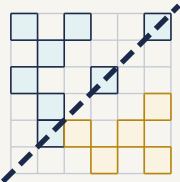
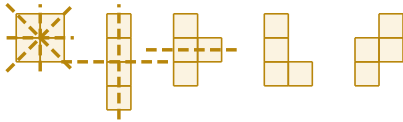
/ 10 marks

Q	Answer	Working / sample response	Marks
1	No	The two triangles are the same size and shape, but if you fold along the diagonal they do not land on each other. One triangle is a half turn of the other. A parallelogram like this has no lines of symmetry. <i>1 mark: No.</i> <i>1 mark: explains that the halves must match when folded, not just be the same shape.</i>	2
2	False	A square has 4 equal sides and 4 lines of symmetry. But a rhombus that is not a square also has 4 equal sides and only 2 lines of symmetry (its diagonals). So the statement is false. <i>1 mark: False.</i> <i>1 mark: gives the rhombus (or a sketch of one) as a counter-example.</i>	2
3	Sometimes	Always Sometimes Never An isosceles triangle has 1 line and an equilateral triangle has 3, so it can be true. A scalene triangle (all sides different) has no lines, so it is not always true. <i>1 mark: Sometimes.</i> <i>1 mark: one triangle with a line of symmetry and one without (e.g. scalene).</i>	2
4	Same: 2 lines each	  Same: both shapes have exactly 2 lines of symmetry, one across and one up and down. Different: the rectangle's lines go through the middles of the sides. The rhombus's lines go through the corners (they are its diagonals). <i>1 mark: same number of lines (2).</i> <i>1 mark: explains the rectangle's lines join the middles of sides and the rhombus's lines join corners.</i>	2

Q	Answer	Working / sample response	Marks									
		<table><tr><td></td><td>Horizontal: yes</td><td>Horizontal: no</td></tr><tr><td>Vertical: yes</td><td>H, X</td><td>T, M</td></tr><tr><td>Vertical: no</td><td>E, D</td><td>N, S</td></tr></table>		Horizontal: yes	Horizontal: no	Vertical: yes	H, X	T, M	Vertical: no	E, D	N, S	
	Horizontal: yes	Horizontal: no										
Vertical: yes	H, X	T, M										
Vertical: no	E, D	N, S										
5	See table	Vertical and horizontal: H, X. Vertical only: T, M. Horizontal only: E, D. Neither: N, S. Extra letters, e.g. both: I, O. Vertical only: A, U, V, W, Y. Horizontal only: B, C, K. Neither: F, G, J, L, P, R, Z. <i>1 mark: all eight letters sorted correctly.</i> <i>1 mark: a correct extra letter in all four boxes.</i>	2									

D Challenge *solutions and criteria*

/ 9 marks

Q	Answer	Working / sample response	Marks
1	a) 3 and 3 b) 20 c) 5	 a) 6 lines: 3 join opposite corners, 3 join the middles of opposite sides. b) A regular shape has as many lines of symmetry as it has sides: 20. c) 10 lines. With an even number of sides, half go through two corners: $10 \div 2 = 5$. <i>1 mark: a) 3 and 3 (with lines drawn).</i> <i>1 mark: b) 20.</i> <i>1 mark: c) 5.</i>	3
2	13 squares	 Now shaded: 5 above the line and 3 that the line passes through. Only the 5 squares above the line get a new partner: $5 + 5 + 3 = 13$. Squares on the mirror line are their own reflection, so they are not doubled. <i>1 mark: pattern completed correctly.</i> <i>1 mark: 13.</i> <i>1 mark: explains that squares on the line are not doubled.</i>	3
3	The square (4 lines)	 The five shapes: square (4 lines), straight line of 4 (2 lines), T shape (1 line), L shape (0), S or Z shape (0). The 2 by 2 square has the most: 4 lines. <i>1 mark: all five different shapes drawn.</i> <i>1 mark: lines of symmetry correct on all five.</i> <i>1 mark: the square, with 4 lines.</i>	3