

WA6MMGTW3

Two-dimensional space and structures

Core + Challenge

Area of Rectangles — Marking Key

I can find the area of rectangles using length $\times$ width, find missing sides and split up composite shapes.

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

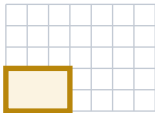
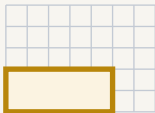
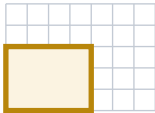
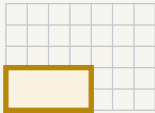
Marks summary

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	15 cm ²	3 rows of 5: $3 \times 5 = 15$.	1
2	12 cm ²	2 rows of 6: $2 \times 6 = 12$.	1
3	16 cm ²	4 rows of 4: $4 \times 4 = 16$.	1
4	21 cm ²	3 rows of 7: $3 \times 7 = 21$.	1
5	e.g. 3×2	 Any rectangle with 1×6 or 2×3 squares.	1
6	e.g. 5×2	 Any rectangle with 2×5 squares.	1
7	e.g. 4×3	 Any rectangle with 2×6 or 3×4 squares.	1
8	e.g. 4×2	 Any rectangle with 2×4 squares.	1
9	40 cm ²	$8 \times 5 = 40$ cm ² .	1
10	54 m ²	$9 \times 6 = 54$ m ² .	1

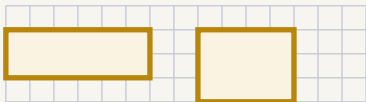
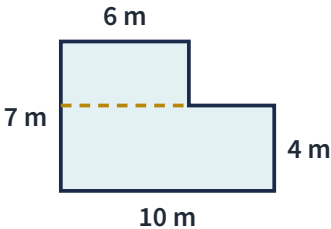
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Q	Answer	Model answer / notes	Marks
11	36 cm ²	$12 \times 3 = 36 \text{ cm}^2$.	1
12	70 m ²	$10 \times 7 = 70 \text{ m}^2$.	1
13	4 cm	$20 \div 5 = 4$, because $5 \times 4 = 20$.	1
14	6 m	$42 \div 7 = 6$, because $7 \times 6 = 42$.	1
15	4 cm	$36 \div 9 = 4$, because $9 \times 4 = 36$.	1
16	6 m	$48 \div 8 = 6$, because $8 \times 6 = 48$.	1

B

Practise *answers and working*

/ 21 marks

Q	Answer	Working / sample response	Marks
1	$6 \text{ cm} \times 3 \text{ cm} = 18 \text{ cm}^2$	Length 6 cm, width 3 cm. Area = $6 \times 3 = 18 \text{ cm}^2$. <i>1 mark: both measurements.</i> <i>1 mark: 18 cm^2 (follow through from their measurements).</i>	2
2	e.g. 6×2 and 4×3	 <i>1 mark for each correct rectangle with its sides.</i>	2
3	58 m ²	 <i>1 mark: correct split and missing sides.</i> <i>1 mark: both areas.</i> <i>1 mark: 58 m^2.</i>	3
4	96 m ² , \$864	Area = $12 \times 8 = 96 \text{ m}^2$. Cost = $96 \times \$9 = \$864$. <i>1 mark: 96 m^2.</i> <i>1 mark: \$864.</i>	2
5	8 m; 34 m	Other side = $72 \div 9 = 8 \text{ m}$. Perimeter = $9 + 8 + 9 + 8 = 34 \text{ m}$. <i>1 mark: 8 m.</i> <i>1 mark: 34 m.</i>	2

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Q	Answer	Working / sample response	Marks																												
6	See table	<table><thead><tr><th>Length</th><th>Width</th><th>Area</th></tr></thead><tbody><tr><td>6 cm</td><td>4 cm</td><td>24 cm²</td></tr><tr><td>7 cm</td><td>8 cm</td><td>56 cm²</td></tr><tr><td>9 cm</td><td>5 cm</td><td>45 cm²</td></tr><tr><td>12 cm</td><td>5 cm</td><td>60 cm²</td></tr></tbody></table> Area: $6 \times 4 = 24 \text{ cm}^2$. Missing sides: $56 \div 7 = 8 \text{ cm}$, $45 \div 5 = 9 \text{ cm}$, $60 \div 12 = 5 \text{ cm}$. 3 marks: all four rows. 2 marks: three rows. 1 mark: two rows.	Length	Width	Area	6 cm	4 cm	24 cm ²	7 cm	8 cm	56 cm ²	9 cm	5 cm	45 cm ²	12 cm	5 cm	60 cm ²	3													
Length	Width	Area																													
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7 cm	8 cm	56 cm ²																													
9 cm	5 cm	45 cm ²																													
12 cm	5 cm	60 cm ²																													
7	Stamp 6 cm ² , phone 100 cm ² , classroom 60 m ² , court 420 m ²	a postage stamp a phone screen a classroom floor a basketball court about 60 m² about 6 cm² about 420 m² about 100 cm² Small flat things are measured in cm²; rooms and courts in m². A basketball court is about $28 \text{ m} \times 15 \text{ m} = 420 \text{ m}^2$; a classroom about $8 \text{ m} \times 8 \text{ m}$. 2 marks: all four. 1 mark: two correct.	2																												
8	28 cm ²	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> The top row shows 7 squares in each row. The left column shows 4 rows. $4 \times 7 = 28 \text{ cm}^2$. 1 mark: uses 7 squares in a row and 4 rows. 1 mark: 28 cm².																													2
9	72 m ²	Whole area: $14 \times 8 = 112 \text{ m}^2$. Pool: $10 \times 4 = 40 \text{ m}^2$. Paving: $112 - 40 = 72 \text{ m}^2$. 1 mark: 112 m². 1 mark: 40 m². 1 mark: 72 m².	3																												

C

Think it through *sample answers and criteria*

/ 10 marks

Q	Answer	Working / sample response	Marks									
1	No, it is 40 cm ²	Ella added the four sides: 8 + 5 + 8 + 5 = 26. That is the perimeter (26 cm), not the area. Area = 8 × 5 = 40 cm². <i>1 mark: explains she found the perimeter (added the sides).</i> <i>1 mark: 40 cm².</i>	2									
2	False	Example: 3 cm × 2 cm = 6 cm². Doubled: 6 cm × 4 cm = 24 cm². 24 is 4 times 6, so the area is 4 times as big, not double. <i>1 mark: False.</i> <i>1 mark: a correct example showing the area is 4 times as big.</i>	2									
3	Sometimes	Always Sometimes Never True: 4 × 5 (P 18, A 20) beats 2 × 3 (P 10, A 6). False: 1 × 10 has P 22 but A 10; 4 × 4 has P 16 but A 16. <i>1 mark: Sometimes.</i> <i>1 mark: one example each way.</i>	2									
4	5 cm × 5 cm	3 × 8, 4 × 6 and 2 × 12 all have an area of 24 cm². 5 × 5 = 25 cm², so it is the odd one out. (It is also the only square.) <i>1 mark: chooses 5 cm × 5 cm.</i> <i>1 mark: a correct reason: its area is 25 cm² and the others are all 24 cm² (also accept: it is the only square).</i>	2									
5	See table	<table><tr><td></td><td>Perimeter > 20 cm</td><td>Perimeter ≤ 20 cm</td></tr><tr><td>Area > 24 cm²</td><td>6 × 5, 7 × 4</td><td>5 × 5</td></tr><tr><td>Area ≤ 24 cm²</td><td>2 × 10, 1 × 15</td><td>3 × 4, 4 × 5</td></tr></table> Work out each area and perimeter first. 5 × 5: area 25 cm² (more than 24) but perimeter 20 cm (not more than 20). <i>1 mark: all seven sorted correctly (accept six).</i> <i>1 mark: explains 5 × 5 with area 25 and perimeter 20.</i>		Perimeter > 20 cm	Perimeter ≤ 20 cm	Area > 24 cm ²	6 × 5, 7 × 4	5 × 5	Area ≤ 24 cm ²	2 × 10, 1 × 15	3 × 4, 4 × 5	2
	Perimeter > 20 cm	Perimeter ≤ 20 cm										
Area > 24 cm ²	6 × 5, 7 × 4	5 × 5										
Area ≤ 24 cm ²	2 × 10, 1 × 15	3 × 4, 4 × 5										

D

Challenge *solutions and criteria*

/ 9 marks

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Q	Answer	Working / sample response	Marks
1	1 × 24, 2 × 12, 3 × 8, 4 × 6; smallest P: 4 × 6	24 × 1 (P = 50 cm), 12 × 2 (P = 28 cm), 8 × 3 (P = 22 cm), 6 × 4 (P = 20 cm). Work through the widths in order: 1, 2, 3, 4 all divide 24; 5 does not; after 4 × 6 the pairs repeat (6 × 4). The 4 × 6 rectangle has the smallest perimeter (20 cm). <i>1 mark: all four rectangles.</i> <i>1 mark: 4 × 6 with a perimeter of 20 cm.</i> <i>1 mark: explains a systematic search (the pairs start repeating).</i>	3
2	10 cm × 5 cm; 50 cm ²	Length + width = half of 30 = 15 cm. Length is double the width, so width + 2 × width = 15: 3 widths = 15, width = 5 cm, length = 10 cm. Check: 10 + 5 + 10 + 5 = 30. Area = 10 × 5 = 50 cm². <i>1 mark: length + width = 15 (or a guess-and-check table).</i> <i>1 mark: 10 cm and 5 cm.</i> <i>1 mark: 50 cm².</i>	3
3	6 m sides; square by 2 m	Area = 9 × 4 = 36 m². A square with area 36 m² has sides of 6 m (6 × 6 = 36). Fencing: rectangle 9 + 4 + 9 + 4 = 26 m; square 4 × 6 = 24 m. The square needs 2 m less fencing. <i>1 mark: 6 m.</i> <i>1 mark: both perimeters (26 m and 24 m).</i> <i>1 mark: square, 2 m less.</i>	3