

WA6MMGMM1

Modelling with measurement and geometry

Core + Challenge

Problem Solving with Measurement — Marking Key

I can solve real problems with timetables, distance, area, volume and money, and justify my answers.

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: 23 C Think it through: 10 D Challenge: 9 **Total: 58**

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

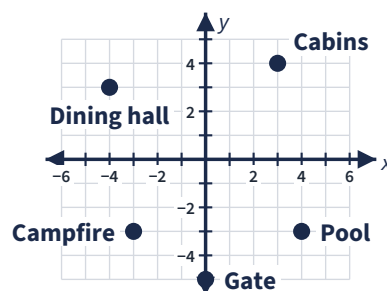
A

Warm up *answers*

/ 16 marks

Q	Answer	Model answer / notes	Marks
1	24 m ²	$6 \times 4 = 24 \text{ m}^2$.	1
2	21 cm ²	$7 \times 3 = 21 \text{ cm}^2$.	1
3	10 m ²	$4 \times 2.5 = 10 \text{ m}^2$ (2.5 + 2.5 + 2.5 + 2.5).	1
4	81 m ²	A square has equal sides: $9 \times 9 = 81 \text{ m}^2$.	1
5	12 cm ³	3 long $\times$ 2 deep $\times$ 2 high = 12 cubes (count the hidden ones).	1
6	24 cm ³	$4 \times 2 \times 3 = 24$ cubes.	1
7	40 cm ³	$5 \times 4 \times 2 = 40 \text{ cm}^3$.	1
8	90 cm ³	$10 \times 3 \times 3 = 90 \text{ cm}^3$.	1

9 (4, -3)



1

4 right, 3 down. The camp map is shown for items 9–12.

10	(-3, -3)	3 left, 3 down.	1
11	Dining hall	4 left, 3 up.	1
12	70 m	Same y-coordinate: from -3 to 4 is 7 units. $7 \times 10 \text{ m} = 70 \text{ m}$.	1
13	1250 mL	$1.25 \times 1000 = 1250$.	1

Problem Solving with Measurement · WA6MMGMM1

Q	Answer	Model answer / notes	Marks
14	200 min	$3 \times 60 + 20 = 200$.	1
15	600 m	$0.6 \times 1000 = 600$.	1
16	2.05 kg	50 g = 0.05 kg, so 2.05 kg (not 2.5 kg).	1

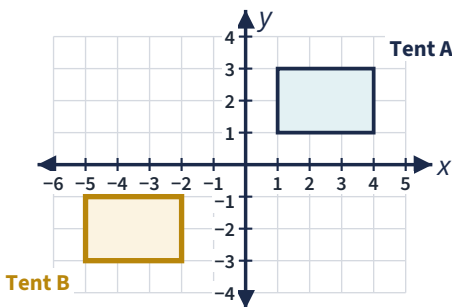
B

Practise *answers and working*

/ 23 marks

Q	Answer	Working / sample response	Marks
1	a) 07:30 there, 16:10 back b) 8 h 5 min	a) Go on the first ferry (07:30, arrives 08:05). 5:00 pm = 17:00: the 16:10 ferry arrives 16:40 (in time), the 17:30 ferry arrives 18:00 (too late). b) On the island from 08:05 to 16:10: 08:05 → 16:05 is 8 h, plus 5 min = 8 h 5 min. <i>1 mark: 07:30 ferry.</i> <i>1 mark: 16:10 ferry with reason.</i> <i>1 mark: 8 h 5 min.</i>	3
2	Yes: \$338, \$12 left	Ferry: $2 \times \\$74 + 2 \times \\$38 = \\$148 + \\$76 = \\$224$ (the 3-year-old is free). Bikes: $2 \times \\$30 + 2 \times \\$22 + \\$10 \text{ seat} = \\$60 + \\$44 + \\$10 = \\$114$. Total $\\$224 + \\$114 = \\$338$. $\\$350 - \\$338 = \\$12$ left, so yes. <i>1 mark: ferry \$224.</i> <i>1 mark: bikes \$114.</i> <i>1 mark: \$338 and a clear yes with \$12 left.</i>	3
3	a) 4 km b) 13 km	a) (5, -2) to (-3, -2): $5 + 3 = 8$ units. $8 \times 500 \text{ m} = 4000 \text{ m} = 4 \text{ km}$. b) Lighthouse → (-6, -2): 3 units; → West End (-6, 0): 2 units. One way $8 + 3 + 2 = 13$ units = 6.5 km. There and back: 13 km. <i>1 mark: 4 km.</i> <i>1 mark: 13 units (6.5 km) one way.</i> <i>1 mark: 13 km.</i>	3
4	a) 6 m ² b) 3 m ³ c) \$195	a) $3 \times 2 = 6 \text{ m}^2$. b) $3 \times 2 \times 0.5 = 3 \text{ m}^3$ (half of 6). c) $3 \times \\$45 = \\$135$, plus $\\$60 = \\$195$. <i>1 mark for each part.</i>	3
5	a) 24 b) 7 cartons	a) 4 along $\times$ 3 across $\times$ 2 high = 24 blocks. b) 6 cartons hold 144 blocks, which is not enough, so 7 cartons are needed. <i>1 mark: 24.</i> <i>1 mark: 7 cartons.</i>	2

Problem Solving with Measurement · WA6MMGMM1

Q	Answer	Working / sample response	Marks
6	a) $(-5, -3), (-2, -3), (-2, -1), (-5, -1)$ b) 24 m^2	 a) Subtract 6 from each x and 4 from each y: $(1, 1) \rightarrow (-5, -3), (4, 1) \rightarrow (-2, -3), (4, 3) \rightarrow (-2, -1), (1, 3) \rightarrow (-5, -1)$. b) The tent is 3 units by 2 units = 6 m by 4 m. $6 \times 4 = 24 \text{ m}^2$. <i>1 mark: Tent B drawn correctly.</i> <i>1 mark: all four corners.</i> <i>1 mark: 24 m^2 (not 6 m^2).</i>	3
7	4 bottles, \$12.80	$26 \times 250 = 6500 \text{ mL} = 6.5 \text{ L}$. 3 bottles hold only 6 L, so 4 bottles are needed: $4 \times \\$3.20 = \\$12.80$. <i>1 mark: 4 bottles with reason.</i> <i>1 mark: \$12.80.</i>	2
8	10:25 am	Total time: $1 \text{ h } 50 \text{ min} + 25 \text{ min} = 2 \text{ h } 15 \text{ min}$. $08:10 + 2 \text{ h } 15 \text{ min} = 10:25 = 10:25 \text{ am}$. <i>1 mark: 2 h 15 min.</i> <i>1 mark: 10:25 am.</i>	2
9	Under, by 180 kg	Bags: $45 \times 12 = 540 \text{ kg}$. Crates: $8 \times 35 = 280 \text{ kg}$. Total 820 kg. 1 t = 1000 kg, so it is 180 kg under the limit. <i>1 mark: 820 kg.</i> <i>1 mark: under the limit by 180 kg.</i>	2

C

Think it through *sample answers and criteria*

/ 10 marks

Q	Answer	Working / sample response	Marks
1	No, it is 12 m^2	Ben added the four sides ($4 + 3 + 4 + 3 = 14 \text{ m}$). That is the perimeter. Area = $4 \times 3 = 12 \text{ m}^2$ (12 one-metre squares cover it). <i>1 mark: No, 12 m^2.</i> <i>1 mark: explains he found the perimeter.</i>	2
2	False: it is 8 times	$2 \times 3 \times 4 = 24 \text{ cm}^3$. Doubled: $4 \times 6 \times 8 = 192 \text{ cm}^3$. $192 \div 24 = 8$, so the volume is 8 times bigger ($2 \times 2 \times 2$), not 2 times. <i>1 mark: False.</i> <i>1 mark: both volumes (24 cm^3 and 192 cm^3) or the $\times 8$ reason.</i>	2

Problem Solving with Measurement · WA6MMGMM1

Q	Answer	Working / sample response	Marks
3	Sometimes	5 m × 4 m (perimeter 18 m, area 20 m²) beats 3 m × 3 m (perimeter 12 m, area 9 m²), so it can be true. 10 m × 1 m has perimeter 22 m but area only 10 m², less than 4 m × 4 m (perimeter 16 m, area 16 m²), so it is not always true. <i>1 mark: Sometimes.</i> <i>1 mark: one example each way.</i>	2
4	1 h 50 min	1.5 h is one and a half hours = 1 h 30 min = 90 min. 1 h 50 min is 110 min. (1.5 h does not mean 1 h 50 min.) <i>1 mark: 1 h 50 min.</i> <i>1 mark: explains 0.5 h = 30 min.</i>	2
5	One 4 L + three 1 L: \$106	One 4 L tin + three 1 L tins = \$58 + \$48 = \$106 (exactly 7 L). Two 4 L tins = \$116 and seven 1 L tins = \$112, so \$106 is cheapest. <i>1 mark: one 4 L and three 1 L tins, \$106.</i> <i>1 mark: compares with at least one other option.</i>	2

D

Challenge solutions and criteria

/ 9 marks

Q	Answer	Working / sample response	Marks
1	5 m × 5 m (25 m ²)	Length + width = 10 m. Beds: 1 × 9, 2 × 8, 3 × 7, 4 × 6, 5 × 5. Areas: 9, 16, 21, 24, 25 m². The 5 m × 5 m square gives the most area: 25 m². <i>1 mark: length + width = 10.</i> <i>1 mark: all five beds listed.</i> <i>1 mark: 5 m × 5 m, 25 m².</i>	3
2	6 boxes; 2 × 3 × 4	1 × 1 × 24, 1 × 2 × 12, 1 × 3 × 8, 1 × 4 × 6, 2 × 2 × 6, 2 × 3 × 4. Listing from the smallest edge up shows none are missed. 2 × 3 × 4 has edges that are closest together, so it is closest to a cube. <i>2 marks: all six boxes (1 mark for four or five).</i> <i>1 mark: 2 × 3 × 4.</i>	3
3	a) A, by \$173.40 b) 31 people	a) A: 98 × 2 = 196 km, 196 × \$2.10 = \$411.60. B: 45 × \$6.50 × 2 = \$585. A is cheaper by \$173.40. b) Option B costs \$13 per person. 31 × \$13 = \$403 (cheaper than \$411.60), 32 × \$13 = \$416 (dearer). So 31 people. <i>1 mark: \$411.60.</i> <i>1 mark: \$585 and A cheaper by \$173.40.</i> <i>1 mark: 31.</i>	3