

WA7MNAUN8

Understanding number

Core + Challenge

Mental Strategies with Number Laws — Marking Key

I can use the number laws, partitioning and inverse operations to calculate mentally and check statements.

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

Marks summary

Section A Fluency: 16 Section B Core: 21 Section C Reasoning: 9 Section D Challenge: 9 **Total: 55**

Fluency: 1 mark each; accept an equivalent unsimplified answer for half credit at tutor's discretion.

A Fluency *answers and working*

/ 16 marks

Q	Answer	Working
1	1700	$25 \times 4 = 100; 100 \times 17 = 1700$
2	1200	$4 \times 4 \times 3 \times 25 = (4 \times 25) \times 3 \times 4 = 1200$
3	11	$4 \times 2 + 4 \times \frac{3}{4} = 8 + 3 = 11$
4	594	$100 \times 6 - 6 = 594$
5	120	$24 \times 5 = 120$
6	10.5	$15.3 - 5 + 0.2 = 10.5$
7	12.6	$(3.7 + 6.3) + 2.6 = 12.6$
8	38	$(5 \times 2) \times 3.8 = 38$
9	728	$7 \times 100 + 7 \times 4 = 728$
10	2000	$125 \times 8 \times 2 = 2000$
11	8	$-27 + 27 + 8 = 8$
12	9	$6 + 3 = 9$
13	24	$360 \div 3 \div 5 = 24$
14	12	$\frac{1}{4}$ of 48 = 12
15	147	$(19 + 81) + 47 = 147$
16	360	$4 \times 90 = 360$

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B

Core *answers, working and marks*

/ 21 marks

Q	Answer	Working / sample response	Marks
1	1700	$4 \times 25 = 100$, then $\times 17$ <i>1 mark: strategy</i> <i>1 mark: 1700</i>	2
2	\$59.94	$6 \times 10 - 6 \times 0.01 = 60 - 0.06$ <i>1 mark: strategy</i> <i>1 mark: \$59.94</i>	2
3	266	$7 \times 40 - 7 \times 2 = 280 - 14$ <i>1 mark: partition</i> <i>1 mark: 266</i>	2
4	\$200	$(23 + 77) + (58 + 42) = 100 + 100$ <i>1 mark: pairing</i> <i>1 mark: \$200</i>	2
5	\$186	$12 \times 15 + 12 \times 0.5 = 180 + 6$ <i>1 mark: partition</i> <i>1 mark: \$186</i>	2
6	(a) True (b) False (equal) (c) False (equal)	(a) $48 = 12 \times 4$ and $4 \times 2.5 = 10$ (b) $12 \div 2 = 6$, so both are 15×6 (c) dividing by the same two numbers in any order gives the same result <i>1 mark each with reason</i>	3
7	(a) $\frac{3}{8}$ (b) 4.6	(a) $\frac{5}{8} - \frac{2}{8} = \frac{3}{8}$ (b) $16.1 \div 3.5 = 4.6$ <i>1 mark each</i>	2
8	900 m ²	$25 \times 36 = 25 \times 4 \times 9 = 100 \times 9$ <i>1 mark: strategy</i> <i>1 mark: 900 m²</i>	2
9	-6 °C	$-12 + 23 = 11$; $11 - 17 = -6$ <i>1 mark: working</i> <i>1 mark: -6 °C</i>	2
10	\$39.60	$8 \times 5 - 8 \times 0.05 = 40 - 0.40$ <i>1 mark: strategy</i> <i>1 mark: \$39.60</i>	2

C

Reasoning *sample answers and marking criteria*

/ 9 marks

Q	Answer	Working / sample response	Marks
1	Commutative/associative laws	$16 = 4 \times 4$ and $75 = 3 \times 25$; reordering puts $4 \times 25 = 100$ together. <i>2 marks</i>	2

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Q	Answer	Working / sample response	Marks
2	False	Left side: $9 \div 3.4$ is less than 3. Right side: $22.5 + 3 = 25.5$. The distributive law works for multiplying a sum, not for dividing by a sum. 1 mark: false 1 mark: estimate of each side 1 mark: explanation	3
3	$5 = 10 \div 2$	Multiplying by 5 is the same as multiplying by 10 then halving. 2 marks	2
4	False	Both sides have $\frac{5}{8}$. Compare $\frac{3}{8}$ with $\frac{1}{5} + \frac{3}{5} = \frac{4}{5}$, $\frac{3}{8} < \frac{4}{5}$. 1 mark: false 1 mark: reason	2

D

Challenge solutions and marking criteria

/ 9 marks

Q	Answer	Working / sample response	Marks
1	36 963	$1000 \times 37 - 37 = 37\,000 - 37$ 1 mark: strategy 1 mark: 36 963	2
2	5050	Pair $1 + 100$, $2 + 99$, ... : 50 pairs of 101 $50 \times 101 = 5050$ 1 mark: pairing 1 mark: 50 pairs 1 mark: 5050	3
3	440	$25 \times 0.4 = 10$; $10 \times 44 = 440$ 1 mark: regrouping 1 mark: 440	2
4	$(6 + 4) \times 5 - 2 = 48$	$10 \times 5 - 2 = 48$ 2 marks	2