

WA8MNAC1

Calculating with number

Core + Challenge

Percentage Increase and Decrease — Marking Key

I can increase and decrease amounts by a percentage using decimal multipliers, including GST, discounts and mark-ups.

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: 22 Section C Reasoning: 9 Section D Challenge: 11 **Total: 58**

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	1.15	$100\% + 15\% = 115\%$
2	0.8	$100\% - 20\% = 80\%$
3	1.025	102.5%
4	0.93	93%
5	\$92	80×1.15
6	\$52	65×0.8
7	252	240×1.05
8	396 kg	450×0.88
9	\$39.60	36×1.1
10	\$90.30	129×0.7
11	\$3.60	2.40×1.5
12	70	80×0.875
13	an 8% increase	108% of the original
14	a 35% decrease	65% of the original
15	\$1290	1250×1.032
16	\$37	18.50×2

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B

Core *answers, working and marks*

/ 22 marks

Q	Answer	Working / sample response	Marks
1	\$211.65	Multiplier $1 - 0.15 = 0.85$ $249 \times 0.85 = \$211.65$ <i>1 mark: $\times 0.85$ (or $15\% = \\$37.35$)</i> <i>1 mark: \$211.65</i>	2
2	GST \$34; total \$374	$340 \times 0.1 = \$34$ $340 \times 1.1 = \$374$ <i>1 mark each</i>	2
3	\$4.50	Multiplier $100\% + 150\% = 250\% = 2.5$ $1.80 \times 2.5 = \$4.50$ <i>1 mark: $\times 2.5$</i> <i>1 mark: \$4.50</i>	2
4	13 144	$12\,400 \times 1.06 = 13\,144$ <i>1 mark: $\times 1.06$</i> <i>1 mark: 13 144</i>	2
5	\$27.32	$26.40 \times 1.035 = 27.324$ $\approx \$27.32$ <i>1 mark: $\times 1.035$</i> <i>1 mark: \$27.32</i>	2
6	(a) \$121.50 (b) 32.5%	(a) $180 \times 0.75 = 135$; $135 \times 0.9 = \$121.50$ (b) $0.75 \times 0.9 = 0.675$, so the price is 67.5% of the original $100\% - 67.5\% = 32.5\%$ off (not 35%) <i>1 mark: \$135</i> <i>1 mark: \$121.50</i> <i>1 mark: 32.5%</i>	3
7	6.3 kg	$4.5 \times 1.4 = 6.3$ kg <i>1 mark: $\times 1.4$</i> <i>1 mark: 6.3 kg</i>	2
8	Store B, by 40c	A: $95 \times 0.8 = \$76.00$ B: $84 \times 0.9 = \$75.60$; B is cheaper by \$0.40 <i>1 mark: both prices</i> <i>1 mark: B by 40c</i>	2
9	\$85.32	$79 \times 1.08 = \$85.32$ <i>1 mark: $\times 1.08$</i> <i>1 mark: \$85.32</i>	2
10	(a) 900 g (b) 84c and 70c per 100 g	(a) $750 \times 1.2 = 900$ g (b) $6.30 \div 7.5 = \$0.84$; $6.30 \div 9 = \$0.70$ <i>1 mark: 900 g</i> <i>1 mark: \$0.84</i> <i>1 mark: \$0.70</i>	3

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C

Reasoning *sample answers and marking criteria*

/ 9 marks

Q	Answer	Working / sample response	Marks
1	\$92	She added 15 dollars, not 15 percent of \$80. $15\% \text{ of } 80 = 12$, so $80 + 12 = \\$92$ (or 80×1.15). <i>1 mark: identifies the error</i> <i>1 mark: \$92</i>	2
2	False	$\times 1.5 \times 0.5 = \times 0.75$ e.g. $\\$100 \rightarrow \\$150 \rightarrow \\$75$, which is 25% less than the start. <i>1 mark: false</i> <i>1 mark: justification</i>	2
3	80% is left	Taking off 20% leaves $100\% - 20\% = 80\%$ of the price. $80\% = \frac{80}{100} = 0.8$, so multiply by 0.8. <i>1 mark: 80% remains</i> <i>1 mark: $80\% = 0.8$</i>	2
4	30% off	30% off: $\times 0.7$ 20% then 10%: $\times 0.8 \times 0.9 = \times 0.72$ (28% off) $0.7 < 0.72$, so 30% off gives the lower price. <i>1 mark: $\times 0.7$</i> <i>1 mark: $\times 0.72$</i> <i>1 mark: conclusion</i>	3

D

Challenge *solutions and marking criteria*

/ 11 marks

Q	Answer	Working / sample response	Marks
1	50%	Let the multiplier for the mark-up be m: $m \times 0.8 = 1.2$ $m = 1.2 \div 0.8 = 1.5$ Mark-up = 50% (e.g. cost $\\$100 \rightarrow \\$150 \rightarrow \\$120$) <i>1 mark: $m \times 0.8 = 1.2$</i> <i>1 mark: 1.5</i> <i>1 mark: 50%</i>	3
2	4% decrease	New area = $1.2l \times 0.8w = 0.96lw$ $0.96 = 96\%$, so the area decreases by 4% <i>1 mark: 0.96</i> <i>1 mark: 4% decrease</i>	2
3	26 620; 33.1%	$20\,000 \times 1.1 = 22\,000 \rightarrow \times 1.1 = 24\,200 \rightarrow \times 1.1 = 26\,620$ Increase 6620 $6620 \div 20\,000 = 0.331 = 33.1\%$ (not 30%) <i>1 mark: 26 620</i> <i>1 mark: 6620</i> <i>1 mark: 33.1%</i>	3

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Q	Answer	Working / sample response	Marks
4	20%	Original $\times 1.25 \times m$ = original, so $m = 1 \div 1.25 = 0.8$ e.g. \$2.00 $\rightarrow$ \$2.50; falling back by \$0.50 $0.50 \div 2.50 = 0.2 = 20\%$ decrease <i>1 mark: sets up the reverse</i> <i>1 mark: 0.8</i> <i>1 mark: 20%</i>	3