

WA8MNA1

Calculating with number

Core + Challenge

Percentage Increase and Decrease

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

Name: _____ Date: _____ Score: _____ / 58

Key idea

Increase by $r\%$: multiply by $(100 + r)\%$ written as a decimal. $+15\% \rightarrow \times 1.15$. $\$80 \times 1.15 = \$92$.

Decrease by $r\%$: multiply by $(100 - r)\%$. $20\% \text{ off} \rightarrow \times 0.8$. $\$65 \times 0.8 = \$52$.

GST in Australia is 10% : price including GST = price $\times 1.1$. A **mark-up** is a percentage added to the cost price to set the selling price.

Successive changes multiply: $+10\%$ then $-10\% \rightarrow \times 1.1 \times 0.9 = \times 0.99$, a 1% decrease overall (NOT back to the start).

A Fluency *practise the skill*

/ 16 marks

Work out each answer. 1 mark each.

- | | |
|---|------------------------------------|
| 1. Multiplier for a 15% increase _____ | 9. \$36 plus GST (10%) _____ |
| 2. Multiplier for a 20% decrease _____ | 10. 30% off \$129 _____ |
| 3. Multiplier for a 2.5% increase _____ | 11. Increase \$2.40 by 50% _____ |
| 4. Multiplier for a 7% decrease _____ | 12. Decrease 80 by 12.5% _____ |
| 5. Increase \$80 by 15% _____ | 13. $\times 1.08$ means ... _____ |
| 6. Decrease \$65 by 20% _____ | 14. $\times 0.65$ means ... _____ |
| 7. Increase 240 by 5% _____ | 15. Increase \$1250 by 3.2% _____ |
| 8. Decrease 450 kg by 12% _____ | 16. Increase \$18.50 by 100% _____ |

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B

Core *apply the skill to problems*

/ 22 marks

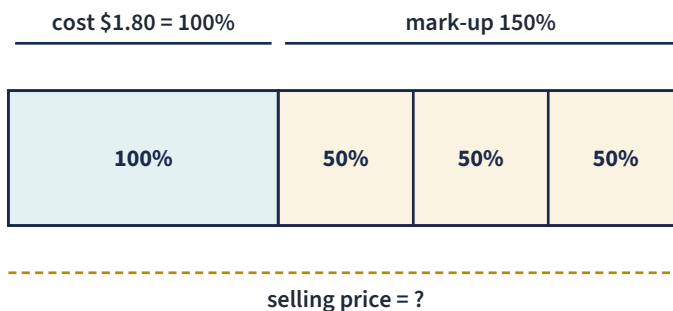
- 1 Headphones marked at \$249 are on sale with 15% off. Find the sale price. [2 marks]

Answer: _____

- 2 A plumber charges \$340 before GST. How much GST is added, and what is the total bill? [2 marks]

Answer: _____

- 3 A café buys muffins for \$1.80 each and applies a mark-up of 150%. What is the selling price of one muffin? [2 marks]



Answer: _____

- 4 The population of a Perth suburb was 12 400. Over five years it grew by 6%. What is the new population? [2 marks]

Answer: _____

- 5 Josh earns \$26.40 per hour. He gets a 3.5% pay rise. What is his new hourly rate, to the nearest cent? [2 marks]

Answer: _____

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- 6 A jacket costs \$180. It is marked 25% off, and at the checkout a further 10% is taken off the sale price. [3 marks]
- (a) Find the final price.
- (b) What single percentage discount is this equivalent to?

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- 7 A puppy weighs 4.5 kg. Over the next month its mass increases by 40%. What does it weigh now? [2 marks]

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Answer:

- 8 Store A sells runners for \$95 with 20% off. Store B sells the same runners for \$84 with 10% off. Which store is cheaper, and by how much? [2 marks]

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Answer:

- 9 A Rottneest ferry ticket costs \$79. Next season the price rises by 8%. What will the new price be? [2 marks]

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Answer:

- 10 A 750 g box of cereal costs \$6.30. A bonus pack has '20% extra free' for the same price. [3 marks]
- (a) How many grams are in the bonus pack?
- (b) Find the price per 100 g before and with the bonus.

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C**Reasoning** *explain, justify and check*

/ 9 marks

- 1 To increase \$80 by 15%, Ella wrote $80 + 15 = \$95$. Explain her mistake and give the correct answer. [2 marks]

- 2 True or false? 'If a price goes up by 50% and then down by 50%, it returns to the original price.' Justify with an example or multipliers. [2 marks]

- 3 Explain why multiplying by 0.8 takes 20% off a price. [2 marks]

- 4 Which is the better deal for a shopper: '30% off', or '20% off, then a further 10% off the sale price'? Show your reasoning. [3 marks]

D**Challenge** *multi-step and problem-solving*

/ 11 marks

- 1 A shop marks up its cost price by a certain percentage, then offers a 20% discount on that marked price. It still makes 20% profit on the cost price. What was the mark-up percentage? [3 marks]

Answer: _____

- 2 The length of a rectangle is increased by 20% and its width is decreased by 20%. By what percentage does its area change? [2 marks]

Answer: _____

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- 3 A town of 20 000 people grows by 10% each year for 3 years (each increase is on the new population). Find the population after 3 years and the overall percentage increase. [3 marks]

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Answer: _____

- 4 The price of petrol rises by 25%. By what percentage must the new price fall to return to the original price? [3 marks]

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Answer: _____

How did I go?

Fluency ____ / 16 Core ____ / 22 Reasoning ____ / 9 Challenge ____ / 11 **Total ____ / 58**

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