Percentages and financial mathematics â€” topic test

15 questions | 37 marks | 45 minutes

A progressive mixed paper covering percentage change, reverse percentages, comparisons, budgets and transparent financial models.

Equivalent correct methods earn the corresponding marks.

1. Write the multiplier for a 15% increase. [1 mark]

$100\% + 15\% = 115\% = 1.15$.

Answer: 1.15

2. Find 20% of 85. [1 mark]

$0.2 \times 85 = 17$.

Answer: 17

3. Decrease 120 by 25%. [2 marks]

The remaining multiplier is 0.75.

$120 \times 0.75 = 90$.

Answer: 90

4. A population rises from 200 to 230. Find the percentage increase. [2 marks]

The rise is 30.

$30 \div 200 \times 100\% = 15\%$.

Answer: 15%

5. A 70 AUD ticket has 10% off. Find the sale price. [2 marks]

$70 \times 0.9 = 63$.

Answer: 63 AUD

6. A store pays 32 AUD for an item and marks it up by 25%. Find the listed price. [2 marks]

$32 \times 1.25 = 40$.

Answer: 40 AUD

7. A price is 96 AUD after a 20% discount. Find its original price. [2 marks]

The sale price is 80% of the original.

$96 \div 0.8 = 120$.

Answer: 120 AUD

8. A number becomes 156 after a 30% increase. Find the original number. [2 marks]

$156 \div 1.3 = 120$.

Answer: 120

9. Group A completes 21 of 30 tasks. Group B completes 32 of 50 tasks. Compare their completion rates. [3 marks]

$21 \div 30 \times 100\% = 70\%$.

$32 \div 50 \times 100\% = 64\%$.

Answer: A: 70%; B: 64%; A is higher by 6 percentage points.

10. A rate rises from 25% to 30%. [3 marks]

(a) Find the rise in percentage points. [1 mark]

$30 - 25 = 5$ percentage points.

Answer: 5 percentage points

(b) Find the relative percentage increase. [2 marks]

$5 \div 25 \times 100\% = 20\%$.

Answer: 20%

11. An item costs a shop 60 AUD. It is marked up by 50%, then sold at 20% off its listed price. [4 marks]

(a) Find the listed price. [1 mark]

$60 \times 1.5 = 90$.

Answer: 90 AUD

(b) Find the sale price. [1 mark]

$90 \times 0.8 = 72$.

Answer: 72 AUD

(c) Find the percentage profit on cost. [2 marks]

Profit is $72 - 60 = 12$ AUD.

$12 \div 60 \times 100\% = 20\%$.

Answer: 20%

12. A group has a 100 AUD budget. Three entries cost 18 AUD each, transport costs 22 AUD and food costs 19 AUD. [3 marks]

(a) Find the money left. [2 marks]

$3 \times 18 + 22 + 19 = 95$ AUD.

$100 - 95 = 5$ AUD.

Answer: 5 AUD

(b) Decide whether an extra 8 AUD purchase fits the budget. Explain. [1 mark]

The extra purchase raises total spending to 103 AUD.

Answer: No; it would exceed the budget by 3 AUD.

13. A savings plan starts at 90 AUD. Weekly income is 24 AUD and spending is 14 AUD. [3 marks]

(a) Find the balance after eight weeks. [2 marks]

Net saving is 10 AUD per week.

$90 + 8 \times 10 = 170$ AUD.

Answer: 170 AUD

(b) Give one assumption in this prediction. [1 mark]

The rule leaves out unexpected income, expenses, fees and interest.

Answer: The weekly amounts remain fixed, with no other balance changes.

14. A classroom simple-interest model uses 600 AUD at 3% per year for two years. [3 marks]

(a) Find the interest and final balance. [2 marks]

$600 \times 0.03 \times 2 = 36$ AUD.

$600 + 36 = 636$ AUD.

Answer: 36 AUD interest; 636 AUD balance.

(b) Explain why fees would need an extra term in the model. [1 mark]

The fee must be subtracted according to its amount and timing.

Answer: Fees reduce the balance and are not included in the interest rule.

15. A coat is 120 AUD. Offer A takes 30% off. Offer B takes 20% off, then a further 15% off the reduced price. [4 marks]

(a) Find both final prices and say which offer is cheaper. [2 marks]

$120 \times 0.7 = 84$.

$120 \times 0.8 \times 0.85 = 81.60$.

$84 - 81.60 = 2.40$ AUD.

Answer: A: 84 AUD; B: 81.60 AUD. B is 2.40 AUD cheaper.

(b) Assess the claim that Offer B gives 35% off. [2 marks]

$0.8 \times 0.85 = 0.68$.

The remaining price is 68% of the original, so the discount is 32%.

Answer: The claim is false: the overall discount is 32%.