UNIT TEST #003 | Australian Curriculum Mathematics | UTM7T2U3

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Formulas, and Finance

7 Unit Test

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Instructions: Read all questions carefully to ensure you understand what is being asked. When completing your official tests / exams, your grade will be based upon your: **understanding, fluency, reasoning, and problem solving,** so ensure you show all lines of working and draw accurate, labelled diagrams where necessary. (ACiQ|9.0 Mathematics standard elaborations found on final page (general assessment marking standards)). [Practise tests are marked out of a score of 10]. For multiple choice questions, tick or fill in the circle next to the corresponding letter under the question.

Check your work if you have time. *Remember:* you don't have to start at question one, it's always best to firstly look through the test, highlight the easy looking questions and complete them first, then secondly, go back through and work on the harder questions. Good luck! And remember to breathe!

$$\sum = \frac{\quad}{10} = \quad \%$$

Part 1: Multiple Choice (2 marks)

Question 1:

a) A shop offers a $15\,\%$ discount on an item priced at $\$80$. What is the discount amount?

A. $\$10$ **B.** $\$12$ **C.** $\$15$ **D.** $\$20$

◯ **A** ◯ **B** ◯ **C** ◯ **D**

Space for Q1a...

b) A formula for the cost of a taxi ride is $C = 4 + 2.5d$, where C is the cost in dollars and d is the distance in $kilometres$. What is the cost for a $6\,km$ ride?

A. $\$17$ **B.** $\$19$ **C.** $\$21$ **D.** $\$23$

◯ **A** ◯ **B** ◯ **C** ◯ **D**

Space for Q1b...

Question 2:

a) If $n = 5$, what is the value of the expression $3n + 7$?

A. 15 **B.** 22 **C.** 25 **D.** 30

◯ **A** ◯ **B** ◯ **C** ◯ **D**

Space for Q2a...

b) A bank account earns 2% simple interest per year. If $\$500$ is invested for $1\ year$, what is the interest earned?

A. $\$5$ **B.** $\$10$ **C.** $\$15$ **D.** $\$20$

◯ **A** ◯ **B** ◯ **C** ◯ **D**

Space for Q1b...

Part 2: Short Answer (4 marks)

Question 3:

a) A formula for the perimeter of a rectangle is $P = 2(l + w)$, where l is the length and w is the width. Calculate the perimeter of a rectangle with a length of $8\,cm$ and a width of $5\,cm$.

b) A store increases the price of an item by $20\,\%$. If the original price was $\$50$, what is the new price?

Question 4:

a) Using the formula $A = l \times w,$ find the area of a rectangle with a length of $12\,cm$ and a width of $3\,cm$.

b) A budget allocates $120 for groceries. If 25 % of the budget is spent on vegetables, how much money is spent on vegetables?

Part 3: Problem Solving (4 marks)

Question 5:

a) A phone plan costs $30 per month plus $0.10 per text message. Write a formula for the total cost C in dollars if t text messages are sent. If 150 text messages are sent in a month, calculate the total cost.

b) A jacket is on sale with a $25\,\%$ discount. If the original price is $\$120$, how much will you pay after the discount?

Question 6:

a) A savings account earns simple interest using the formula $I = PRT$, where I is the interest, P is the principal, R is the annual interest rate (as a decimal), and T is the time in years. Calculate the interest earned on $\$1000$ at $3\,\%$ per year for $2\,years$.

b) A shop reduces the price of a shirt by 30% . If the sale price is $\$35$, what was the original price?

Solutions

1a. (0.5 marks)

B. \$12 .

Discount amount :

$$\begin{aligned}\text{Discount} &= 15\,\% \text{ of } \$80 \\ &= \frac{15}{100} \times 80 \\ &= 0.15 \times 80 \\ &= \$12\,.\end{aligned}$$

b. (0.5 marks)

B. \$19 .

Taxi ride cost :

$$C = 4 + 2.5d$$

For $d = 6$,

$$\begin{aligned}C &= 4 + 2.5 \times 6 \\ &= 4 + 15 \\ &= \$19\,.\end{aligned}$$

2a. (0.5 marks)

B. 22 .

Expression evaluation : $3n + 7$

For $n = 5$

$$\begin{aligned}3n + 7 &= 3 \times 5 + 7 \\ &= 15 + 7 \\ &= 22\,.\end{aligned}$$

b. (0.5 marks)

B. \$10 .

Simple interest :

$$I = PRT$$

$$P = 500,$$
$$R = 2\,\% = 0.02\,,$$
$$T = 1\,.$$

$$\begin{aligned}I &= 500 \times 0.02 \times 1 \\ &= \$10\,.\end{aligned}$$

3a. (1 mark)

Perimeter of rectangle :

$$P = 2(l + w)$$

Given :

$$l = 8,\ w = 5$$
$$P = 2(8 + 5)$$
$$= 2 \times 13$$
$$= 26\,cm\,.$$

b. (1 mark)

Price increase :

$$\text{Increase} = 20\,\%\ \text{of}\ \$50$$
$$= \frac{20}{100} \times 50$$
$$= 0.2 \times 50$$
$$= \$10\,.$$

$$\text{New price} = 50 + 10$$
$$= \$60\,.$$

4a. (1 mark)

Area of rectangle :

$$A = l \times w$$

Given :

$$l = 12\,,\ w = 3\,.$$

$$A = 12 \times 3$$
$$= 36\,cm^2$$

b. (1 mark)

Budget for vegetables :

$$\text{Amount} = 25\,\%\ \text{of}\ \$120$$
$$= \frac{25}{100} \times 120$$
$$= 0.25 \times 120$$
$$= \$30\,.$$

5a. (1 mark)

Phone plan cost :

$$C = 30 + 0.10t$$

For $t = 150$

$$C = 30 + 0.10 \times 150$$
$$= 30 + 15$$
$$= \$45\,.$$

b. (1 mark)

Discounted jacket price :

$$\begin{aligned}\text{Discount} &= 25\,\% \text{ of } \$120 \\ &= \frac{25}{100} \times 120 \\ &= 0.25 \times 120 \\ &= \$30\,.\end{aligned}$$

$$\begin{aligned}\text{Sale price} &= \$120 - \$30 \\ &= \$90\,.\end{aligned}$$

6a. (1 mark)

Simple interest :

$$I = PRT$$

Given :

$$P = 1000\,,$$
$$R = 3\,\% = 0.03\,,$$
$$T = 2\,.$$

$$\begin{aligned}I &= 1000 \times 0.03 \times 2 \\ &= \$60\,.\end{aligned}$$

b. (1 mark)

Original price of shirt :

$$\text{Sale price} = 70\,\% \text{ of original price (since 30\% discount)}$$
$$\text{Let original price} = x\,.$$
$$0.7x = 35$$

$$\begin{aligned}x &= \frac{35}{0.7} \\ &= \$50\,.\end{aligned}$$

$$\sum = \frac{}{10} = \quad \%$$

General Assessment Marking Standards

Remember: When your official tests are marked, they won't be a score out of 10, they will be a grade (A,B,C,D,E) based on the following standards:

ACiQ | v9.0

Year 7 Mathematics standard elaborations

		A	B	C	D	E
		The folio of student work contains evidence of the following:				
Mathematical proficiencies	Understanding	accurate and consistent identification, representation, description and connection of mathematical concepts and relationships in complex unfamiliar, complex familiar, and simple familiar situations	accurate identification, representation, description and connection of mathematical concepts and relationships in complex familiar and simple familiar situations	identification, representation, description and connection of mathematical concepts and relationships in simple familiar situations	partial identification, representation and description of mathematical concepts and relationships in some simple familiar situations	fragmented identification, representation and description of mathematical concepts and relationships in isolated and obvious situations
	Fluency	choice, use and application of comprehensive facts, definitions, and procedures to find solutions in complex unfamiliar, complex familiar, and simple familiar situations	choice, use and application of effective facts, definitions, and procedures to find solutions in complex familiar and simple familiar situations	choice, use and application of facts, definitions, and procedures to find solutions in simple familiar situations	choice and use of partial facts, definitions, and procedures to find solutions in some simple familiar situations	choice and use of fragmented facts, definitions and procedures to find solutions in isolated and obvious situations
	Reasoning	comprehensive explanation of mathematical thinking, strategies used, and conclusions reached in complex unfamiliar, complex familiar, and simple familiar situations	detailed explanation of mathematical thinking, strategies used, and conclusions reached in complex familiar and simple familiar situations	explanation of mathematical thinking, strategies used, and conclusions reached in simple familiar situations	partial explanation of mathematical thinking, strategies used, and conclusions reached in some simple familiar situations	fragmented explanation of mathematical thinking, strategies used, and conclusions reached in isolated and obvious situations
	Problem-solving	purposeful use of problem-solving approaches to find solutions to problems.	effective use of problem-solving approaches to find solutions to problems.	use of problem-solving approaches to find solutions to problems.	partial use of problem-solving approaches to make progress towards finding solutions to problems.	fragmented use of problem-solving approaches to make progress towards finding solutions to problems.

Key	shading emphasises the qualities that discriminate between the A–E descriptors

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