UNIT TEST #005 | Australian Curriculum Mathematics | UTM7T3U5

ACACIA TUTORING

Equations, Inequalities, Perimeter, Area, and Volume

7 Unit Test

Free and always will be!

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) Solve the equation $x - 5 = 10$**.**

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

◯ **A** ◯ **B** ◯ **C** ◯ **D**

Space for Q1a...

b) Solve for y in the equation $-5y = -50$.

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

◯ **A** ◯ **B** ◯ **C** ◯ **D**

Space for Q1b...

Question 2:

a) Which unit is most appropriate for measuring the length of a football field?

A. $Millimetres\ (mm)$ **B.** $Centimetres\ (cm)$ **C.** $Metres\ (m)$ **D.** $Kilometres\ (km)$

◯ **A** ◯ **B** ◯ **C** ◯ **D**

Space for Q2a...

b) What is the volume of a cube with each side measuring $3\,cm$?

A. $9\,cm^3$ **B.** $27\,cm^3$ **C.** $81\,cm^3$ **D.** $6\,cm^3$

◯ **A** ◯ **B** ◯ **C** ◯ **D**

Space for Q2b...

Part 2: Short Answer (4 marks)

Question 3:

a) Solve the inequality $\frac{9x}{5} < 5$ **.**

b) Solve for y **in** $-10y - 12 \geq 8$ **.**

Question 4:

a) Convert $2\,metres$ **to** $centimetres$ **.**

b) Find the area of a rectangle with a length of $6\,cm$ **and a width of** $4\,cm$ **.**

Part 3: Problem Solving (4 marks)

Question 5:

a) Solve, then graph $2x \geq -4$ **on a number line.**

b) Saxon has $\$50$. He wants to buy pencils that cost $\$2.20$ each. How many pencils can he buy? Write the answer as an inequality.

Question 6:

a) A garden is in the shape of a rectangle with dimensions $8\,metres$ by $5\,metres$. If you want to put a fence around it, how much fencing do you need?

b) A fish tank is a rectangular prism with dimensions $50\,cm$ long, $30\,cm$ wide, and $40\,cm$ high. Calculate the volume of water it can hold in litres. (Note: $1\ litre = 1000\,cm^3$)

Solutions

1a. (0.5 marks)

C. 15 .

Add 5 to both sides:

$$x-5+5 = 10+5$$
$$x = 15\,.$$

b. (0.5 marks)

B. 10 .

Divide both sides by -5:

$$\frac{-5y}{-5} = \frac{-50}{-5}$$
$$y = 10\,.$$

2a. (0.5 marks)

C. $Metres\ (m)$

Football fields are typically measured in metres.

b. (0.5 marks)

B. $27\,cm^3$

Volume of a cube is side³,
so $3\,cm \times 3\,cm \times 3\,cm$
$= 27cm^3$.

3a. (1 mark)

Multiply both sides by 5:

$$\frac{9x}{5} \times 5 < 5 \times 5,$$
$$9x < 25$$

Divide both sides by 9

$$\frac{9x}{9} < \frac{25}{9}$$
$$x < \frac{25}{9}\ (= 2.77\dot{7})$$

b. (1 mark)

Add 12 to both sides:

$$-10y-12+12 \geq 8\ +12\,,$$
$$-10y \geq 20$$

Divide both sides by -10 (remember, when dividing or multiplying an inequality by a negative number, flip the sign):

$$\frac{-10y}{-10} \leq \frac{20}{-10}\,,$$
$$y \leq -2\,.$$

4a. (1 mark)

$$2 metres$$
$$= 2 \times 100\, cm$$
$$= 200\, cm\,.$$

b. (1 mark)

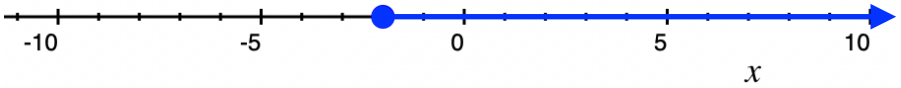
Area = length × width

$$= 6\, cm \times 4\, cm$$
$$= 24\, cm^2\,.$$

5a. (1 mark)

Firstly solve the inequality:

$$2x \geq -4$$
$$\frac{2x}{2} \geq \frac{-4}{2}$$
$$x \geq -2\,.$$



Then graph: draw a closed circle at -2 and extend the line to the right to show all values greater than or equal to -2.

b. (1 mark)

Solve:

$$\frac{2.20x}{2.20} \leq \frac{50}{2.20}$$
$$\rightarrow x \leq 22.72\overline{72}\,.$$

We can't buy 0.72 of a pencil so we round down to 22 pencils.

$\therefore$ Saxon can buy at most 22 pencils.

6a. (1 mark)

Perimeter of the rectangle $= 2 \times$ (length + width)

$$= 2 \times (8 + 5)$$
$$= 2 \times (13)$$
$$= 26\, metres\,.$$

b. (1 mark)

Volume in cm^3 = length × width × height

$$= 50\, cm \times 30\, cm \times 40\, cm$$
$$= 60{,}000\, cm^3\,.$$

Volume in litres $= \dfrac{60{,}000\, cm^3}{1000\, cm^3/L}$

$$= 60\ L\,.$$

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

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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