



National Certificate of Educational Achievement  
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

**2008**

## **Internal Assessment Resource**

Subject Reference: **CAS Mathematics 2.4**

Internal assessment resource reference number:  
**Maths/2/4\_B1**

Supports internal assessment for:

Achievement Standard: 90809

Title: Demonstrate understanding of straightforward mathematical processes

Credits: 5

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**Date version published:**

**Ministry of Education  
quality assurance status**

For use in internal assessment  
from 2008

**Teacher Guidelines:**

The following guidelines are supplied to enable teachers to carry out valid and consistent assessment using this internal assessment resource.

***The assessment schedule must be adapted to include the evidence that is expected from the candidates.***

**Context/setting:**

The questions within this assessment are in general in a mathematical context.

**Conditions:**

Time allocation - this activity should be able to be completed within 1 period of 50 to 60 minutes. Electronic technology may not be used in the assessment of this standard.

**Resource requirements:**

Level 2 Mathematics formula sheet.

**Internal Assessment Resource**

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***Student Instructions Sheet***

**Electronic technology may not be used in this assessment task.**

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**QUESTION ONE**

Simplify  $(64x^6)^{\frac{2}{3}}$

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**QUESTION TWO**

Give the equation of the gradient function to the curve  $y = 12x^3 + x - 7$

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**QUESTION THREE**

Solve  $3 = \log_2 x$

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**QUESTION FOUR**

Find the integral  $\int (6x^3 - 4x + 3)dx$

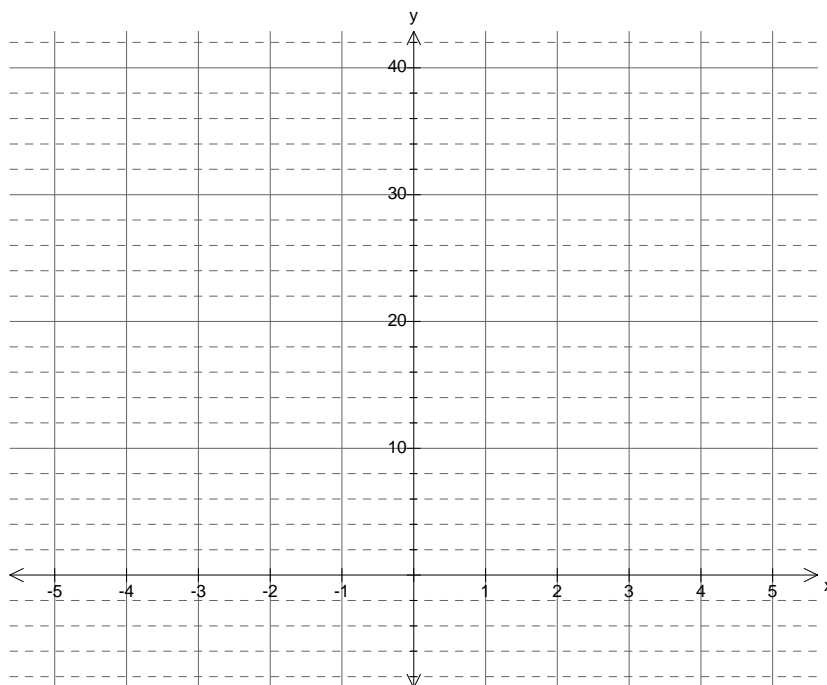
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**QUESTION FIVE**

Sketch the graph of  $y = 2^x$  on the axes below.



**QUESTION SIX**

Rewrite  $\frac{2x^2 - 3x - 2}{3x^2 - 4x - 4}$  in its simplest form.

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**QUESTION SEVEN**

An object is moving in a straight line.

It's velocity is given by  $v = 3t^2 - 2t + 1$

where  $v$  is the velocity in m/sec

and  $t$  is the time in seconds since the object was at a point A.

How far is the object from A after 2 seconds.

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**QUESTION EIGHT**

If a solution to the equation  $3\sin 2x = 1.5$   $-180 \leq x \leq 180$  is  $x = 15^\circ$

Give the other values of  $x$  that satisfy the equation.

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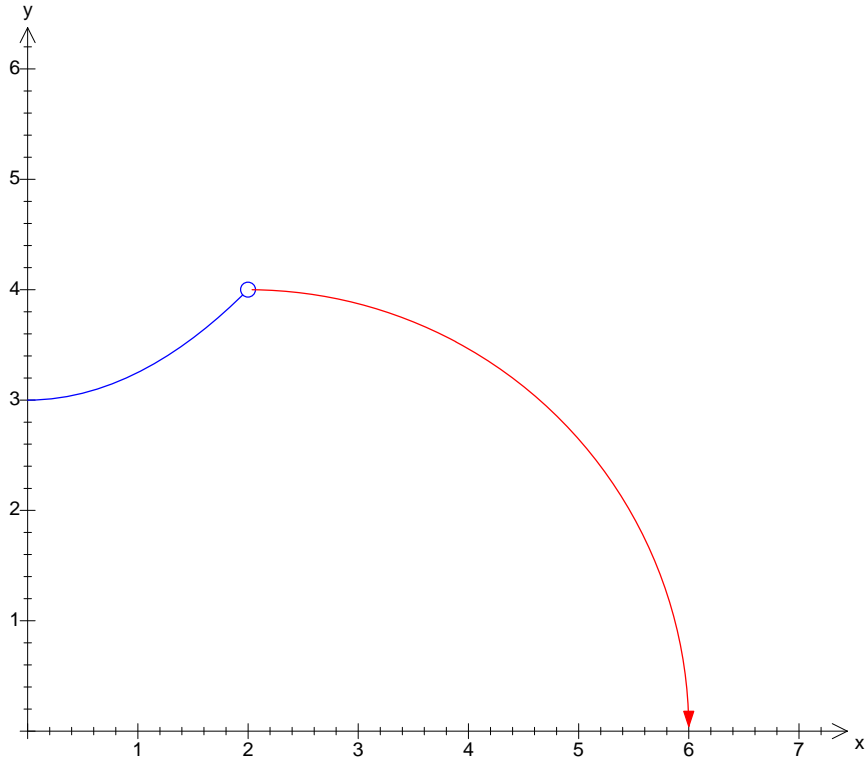
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**QUESTION NINE**

The design for the roof structure for a stand at a new concert venue is based on a parabola and a quarter of a circle.

The graph of the roof design is shown on the graph below.



Give the equations of the graph.

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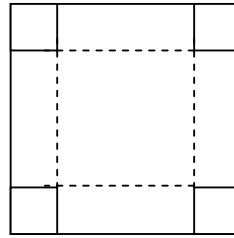
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**QUESTION TEN**

The corners are to be cut from a piece of material that measures 6 m square to make a liner for a square swimming pool.

Find the maximum volume of the liner.



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**QUESTION ELEVEN**

Solve  $\frac{x^2 - 5x + 6}{25 - x^2} \leq 0$

You must show your working. (Evidence of algebraic manipulation.)

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**Assessment schedule CAS Maths/2/4 – A1**

Question	Evidence	Achieved	Merit	Excellence
1		Demonstrate the ability to use straightforward mathematical processes.	Demonstrate the ability to use mathematical processes.	Demonstrate the ability to use mathematical skills to solve problems.
2		Simplified correctly		
3		Gradient function correctly found		
4		Equation solved		
5		Integral correct. Fractions do not need to be simplified		
6		Graph correct		
7		One line factorised	Fully simplified	
8		Distance equation given – not necessarily finding c.	Distance equation found and distance calculated	
9		At least one other solution found	At least 3 solutions given	Equations of both parts of the graph correct and comment on domain / range.
10		Relationship formed.	Equation of 1 part of the graph correct	Volume found
11		Their relationship differentiated	Relationship correct and differentiated	
		Correct comment relating to $x = +/-5$ or 2 and 3	Explanation given on the restrictions for at least 2 points	Inequation correctly solved with explanations given for all 4 points
<b>Sufficiency:</b>		4 satisfied	3 satisfied Or achievement and 2 satisfied	3 satisfied or M plus 2 satisfied

*Examples of acceptable statements must be included in the schedule.*