

Achievement Standard

Subject Reference CAS Mathematics 2.2

Title Demonstrate an understanding of calculus methods

Level 2 **Credits** 4 **Assessment** External

Subfield Mathematics

Domain Calculus

Status Registered **Status date** 16 November 2007

Planned review date 28 February 2009 **Date version published** 16 November 2007

This achievement standard involves demonstrating an understanding of calculus methods.

Note: Candidates cannot use credit for both this achievement standard and AS90286 (Mathematics 2.3) towards a national qualification including a National Certificate of Educational Achievement.

Achievement Criteria

	Achievement Criteria	Explanatory Notes
Achievement	<ul style="list-style-type: none"> Demonstrate an understanding of calculus methods. 	<ul style="list-style-type: none"> This will involve demonstrating an understanding of differentiation and integration in context and may include: <ul style="list-style-type: none"> sketching the gradient or integrated function of a given relationship in graphical form interpreting the gradient and integrated function by finding: <ul style="list-style-type: none"> the point where the gradient has a given value the gradient at a point a simple area under a graph the equation of the function from the gradient function.

	Achievement Criteria	Explanatory Notes
Achievement with Merit	<ul style="list-style-type: none"> Demonstrate an understanding of a range of calculus methods. 	<ul style="list-style-type: none"> Assessment will be based on a selection from: <ul style="list-style-type: none"> locating turning points where $f'(x) = 0$ and determining their nature finding the equation of a tangent to a curve rate of change (such as kinematics) finding simple compound areas contexts used in coordinate geometry.
Achievement with Excellence	<ul style="list-style-type: none"> Demonstrate an understanding of a range of calculus methods in solving problems. 	<ul style="list-style-type: none"> Solving problems may involve: <ul style="list-style-type: none"> forming equations interpreting results optimisation rates of change areas graphical interpretation.

General Explanatory Notes

- This achievement standard is derived from *Mathematics in the New Zealand Curriculum*, Learning Media, Ministry of Education, 1992:
 - achievement objectives p. 82
 - suggested learning experiences p. 83
 - sample assessment activities pp. 84-85
 - mathematical processes p. 26.
- Understanding of $\frac{dy}{dx}$, $f'(x)$ and $\int dx$ notations is expected.
- Demonstrating an understanding* involves more than the mere demonstration of a method such as writing the equation of a function. The method needs to be applied in a context (which could be mathematical).

Quality Assurance

- Providers and Industry Training Organisations must be accredited by NZQA before they can register credits from assessment against achievement standards.
- Accredited providers and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.

Accreditation and Moderation Action Plan (AMAP) reference

0226