Year 11 Mathematics Advanced

Topic: Introduction to Differentiation (6 of 6)
Review Questions: Mixed One-off Exam Questions
Term 3, 2026

How to use this set

These are real past-paper questions on introduction to differentiation that do not fit any one recurring pattern: genuine one-offs. They are here so you also meet the rarer, less predictable exam questions. Work through them once you are solid on the patterns in the main review docs. Every question you get wrong or struggle with goes in your **Mistakes Log**.

Contents

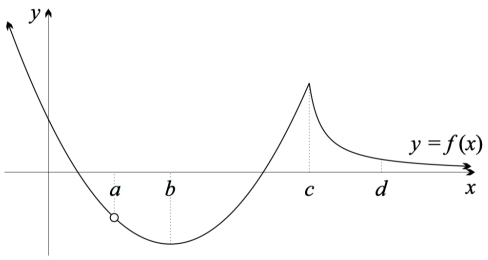
Mixed one-off exam questions

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Q1 Sydney Grammar 2021 Prelim Q5 · **1 mark**

The diagram below shows the graph of $y = f(x)$.



At which value of x is the graph continuous but not differentiable?

(A) a

(B) b

(C) c

(D) d

Q2 Shore 2023 Prelim Q25 · **1 mark**

On a set of axes, draw a graph that is continuous, but not differentiable at $x = 1$.

Q3 Killara 2021 Prelim Q16 · **3 marks**

Sketch the function $y = f(x)$ on the coordinate axes below, given the following information:

- $f(0) = 3$, $f'(2) = 0$, $f(2) = 6$
- $f'(x) > 0$ for $x < 2$
- $f'(x) < 0$ for $x > 2$
- $f'(x) \to 0$ as $x \to \infty$

Q4 Hornsby Girls 2021 Prelim Q16 · **3 marks**

In an assessment task, Jack was asked to find the derivative of the function $y = \dfrac{4x-1}{3-2x^2}$. His first line of working was as follows:

$$\frac{dy}{dx} = \frac{(3-2x^2)(4)-(4x-1)(-4)}{(3-2x^2)^2}$$

(a) Explain the mistake that Jack made in his first line of working.

(b) Write the correct first line of working, and then complete the solution for the derivative of the function.

Q5 St George Girls 2021 Prelim Q8(aii) · **1 mark**

Let $f(x) = |x-2|$. Is this function differentiable at $x = 2$? Explain your answer.

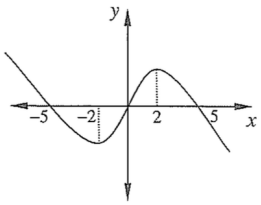
Q6 Abbotsleigh 2024 Prelim Q10 · **1 mark**

Consider a function $y = g(x)$ with the following properties:

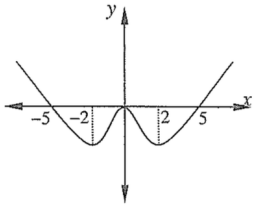
- $g(x)$ is odd.
- $g(5) = 0$ and $g'(2) = 0$.
- $g'(x) > 0$ for $x > 2$.

Which of the following could be the graph of $y = g(x)$?

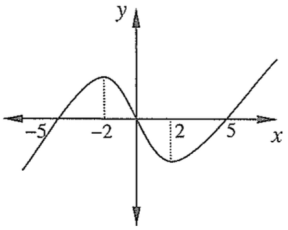
A.



B.



C.



D.

