Past-paper walk-through

Derivative Rules: Constant, Sum, Difference, and Constant Multiple ▪ 2.6

eXercise

Questions in this set

- 2026 Q4

Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- // separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = "or words to that effect" – the wording need not match.

Question 4

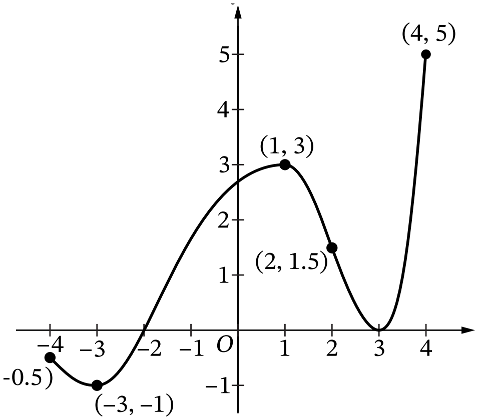
2026 ▪ Q4

Let f be a twice-differentiable function on the closed interval $[-4, 4]$ with $f(2) = 3$. The graph of f', the derivative of f, is shown.
[Graph of f' in the xy-plane, x-axis from -4 to 4 (gridlines at each integer), y-axis from -1 to 5. The curve passes through labelled points: $(-4, -0.5)$, a local minimum at $(-3, -1)$, rising through the origin area, up to a local maximum at $(1, 3)$, back down through $(2, 1.5)$, continuing down to a local minimum at approximately $(3, 0)$ on the x-axis, then rising steeply up to $(4, 5)$. Caption: "Graph of f'".]
(a) For $x > 0$, the function g is defined by $g(x) = f(x) - \ln x$. Find $g'(2)$. Show the work that leads to your answer.
(b) Find all values of x on the open interval $0 < x < 3$ at which the graph of f has a point of inflection. Give a reason for your answer.

Question 4

(c) For $-4 \leq x \leq 4$, on what open intervals, if any, is the graph of f both increasing and concave down? Give a reason for your answer.
(d) For $-4 \leq x \leq 4$, find the value of x at which f has an absolute minimum and the value of x at which f has an absolute maximum. Give reasons for your answers.

Question 4



Graph of f'