Marked example 1

Paper 1 style · No calculator

1 6 marks SL 5.8 ●●○ Typical

Let $f(x) = 2x^3 - 9x^2 + 12x - 4$.

(a) Find the coordinates of the stationary points of the graph of f. **[4]**

(b) Use the second derivative to determine the nature of each stationary point. **[2]**

MARKSCHEME (a)

$f'(x) = 6x^2 - 18x + 12$ **A1**

$6(x-1)(x-2) = 0$ **(M1)**

$x = 1,\ x = 2$ **A1**

$(1,\ 1)$ and $(2,\ 0)$ **A1**

Total 4 marks

Note Award the final A1 only for both points with both coordinates correct.

MARKSCHEME (b)

$f''(x) = 12x - 18;\ f''(1) = -6 < 0$, so $(1, 1)$ is a local maximum **A1**

$f''(2) = 6 > 0$, so $(2, 0)$ is a local minimum **A1**

Total 2 marks

Note A sign diagram of f' instead of the second derivative earns A0A0: the question asks for the second derivative.

Written and verified by a practising IB mathematics teacher, produced with AI assistance; solved twice and recomputed by software. Not affiliated with or endorsed by the International Baccalaureate Organization. © 2026 Hence