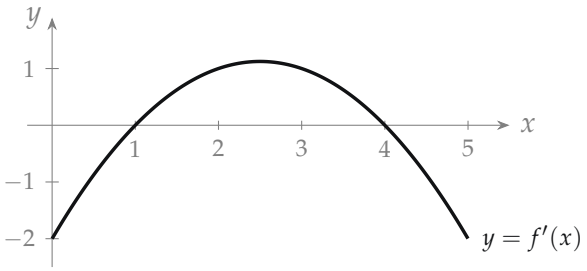
Exercise 2

Paper 1 style · No calculator

2 6 marks SL 5.2 · 5.7 ●●○ Typical

The diagram shows the graph of $y = f'(x)$, the derivative of a function f, for $0 \leq x \leq 5$. The graph of f' is a parabola that crosses the x-axis at $x = 1$ and $x = 4$.



(a) Write down the values of x for which f is increasing. **[2]**

(b) Write down the x-coordinate of the local maximum point of the graph of f. Justify your answer. **[2]**

(c) Write down the x-coordinate of the point of inflexion of the graph of f. **[1]**

(d) State whether the graph of f is concave up or concave down at $x = 3$. Give a reason for your answer. **[1]**

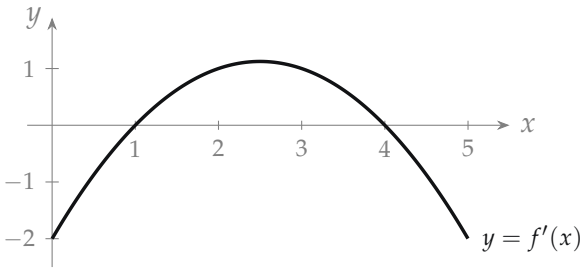
The markscheme is on the next page: try the question first. Written and verified by a practising IB mathematics teacher, produced with AI assistance; solved twice and recomputed by software. Not affiliated with or endorsed by the International Baccalaureate Organization.
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Exercise 2 — markscheme

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MARKSCHEME (a)

$f'(x) > 0$ **(M1)**

$1 < x < 4$ **A1**

Total 2 marks

MARKSCHEME (b)

f' changes sign from positive to negative at $x = 4$ **R1**

$x = 4$ **A1**

Total 2 marks

Note Do not award R0A1. $x = 1$ is the local minimum.

MARKSCHEME (c)

$x = 2.5$ **A1**

Total 1 mark

Note The maximum of f', at the vertex of the parabola, halfway between 1 and 4.

MARKSCHEME (d)

concave down, because f' is decreasing at $x = 3$ (so $f''(3) < 0$) **A1**

Total 1 mark