

Question 3 (7 marks)

Consider the function $f(x)$ for $x \geq 0$ and $x \neq 4$. The graph of $y = f(x)$ is shown in Figure 1.

Points A and C are the function's only stationary points, with x -coordinates of $x = 1$ and $x = 3$ respectively. Point B is the function's only inflection point, with an x -coordinate of $x = 2$. The function also has a vertical asymptote with equation $x = 4$.

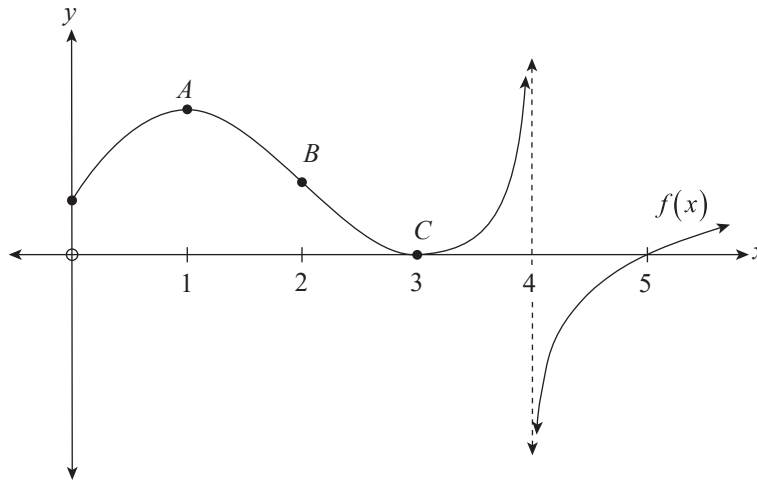


Figure 1

(a) (i) Complete the sign diagram below for $f'(x)$.



(2 marks)

(ii) Complete the sign diagram below for $f''(x)$.



(2 marks)

(b) On the axes in Figure 2, sketch a possible graph of $y = f'(x)$.

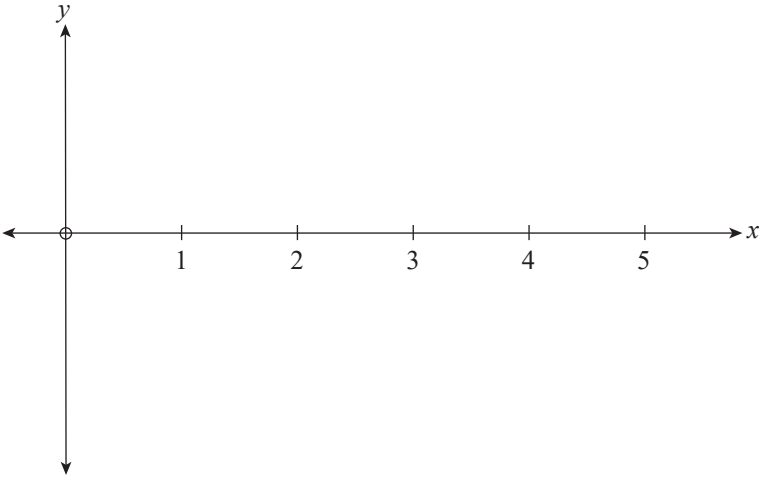


Figure 2

(3 marks)