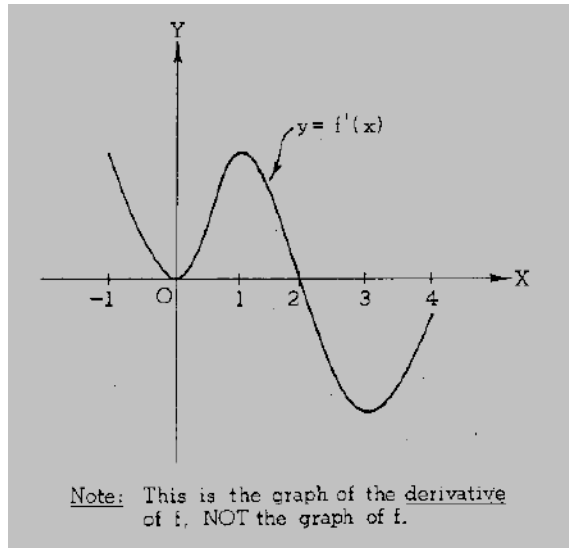


1980 BC 7



Let f be a function that has domain the closed interval $[-1, 4]$ and range the closed interval $[-1, 2]$. Let $f(-1) = -1$, $f(0) = 0$, and $f(4) = 1$. Also let f have the derivative function f' that is continuous and that has the graph shown in the figure above.

- Find all values of x for which f assumes a relative maximum. Justify your answer.
- Find all values of x for which f assumes a relative minimum. Justify your answer.
- Find the intervals on which f is concave downward.
- Give all values of x for which f has a point of inflection.
- Sketch the graph of f .

1984 AB 4 and BC 3 (Hint: do part c first)

A function f is continuous on the closed interval $[-3, 3]$ such that $f(-3) = 4$ and $f(3) = 1$. The function f' and f'' have the properties given in the table below.

x	$-3 < x < -1$	$x = -1$	$-1 < x < 1$	$x = 1$	$1 < x < 3$
$f'(x)$	Positive	Fails to exist	Negative	0	Negative
$f''(x)$	Positive	Fails to exist	Positive	0	Negative

- (a) What are the x -coordinates of all absolute maximum and absolute minimum points of f on the interval $[-3, 3]$? Justify your answer.
- (b) What are the x -coordinates of all points of inflection of f on the interval $[-3, 3]$? Justify your answer.
- (c) Sketch a graph that satisfies the given properties of f .