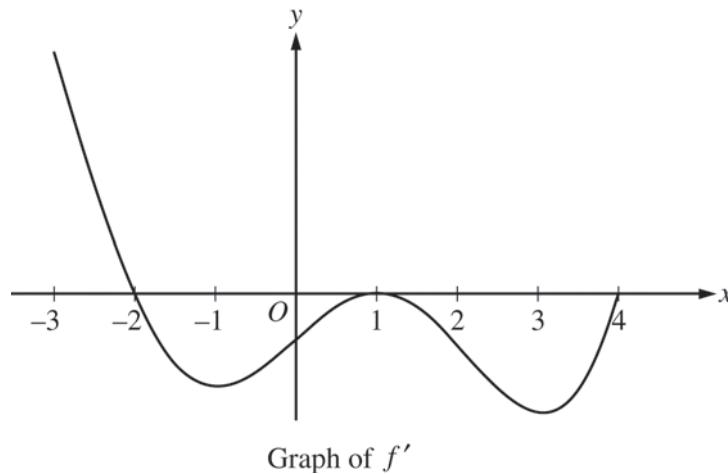


2015 AP[®] CALCULUS AB FREE-RESPONSE QUESTIONS



5. The figure above shows the graph of f' , the derivative of a twice-differentiable function f , on the interval $[-3, 4]$. The graph of f' has horizontal tangents at $x = -1$, $x = 1$, and $x = 3$. The areas of the regions bounded by the x -axis and the graph of f' on the intervals $[-2, 1]$ and $[1, 4]$ are 9 and 12, respectively.
- Find all x -coordinates at which f has a relative maximum. Give a reason for your answer.
 - On what open intervals contained in $-3 < x < 4$ is the graph of f both concave down and decreasing? Give a reason for your answer.
 - Find the x -coordinates of all points of inflection for the graph of f . Give a reason for your answer.
 - Given that $f(1) = 3$, write an expression for $f(x)$ that involves an integral. Find $f(4)$ and $f(-2)$.