

AP[®] CALCULUS AB
2002 SCORING GUIDELINES (Form B)

Question 4

The graph of a differentiable function f on the closed interval $[-3, 15]$ is shown in the figure above. The graph of f has a horizontal tangent line at $x = 6$. Let

$$g(x) = 5 + \int_6^x f(t) dt \text{ for } -3 \leq x \leq 15.$$

- (a) Find $g(6)$, $g'(6)$, and $g''(6)$.
- (b) On what intervals is g decreasing? Justify your answer.
- (c) On what intervals is the graph of g concave down? Justify your answer.
- (d) Find a trapezoidal approximation of $\int_{-3}^{15} f(t) dt$ using six subintervals of length $\Delta t = 3$.

