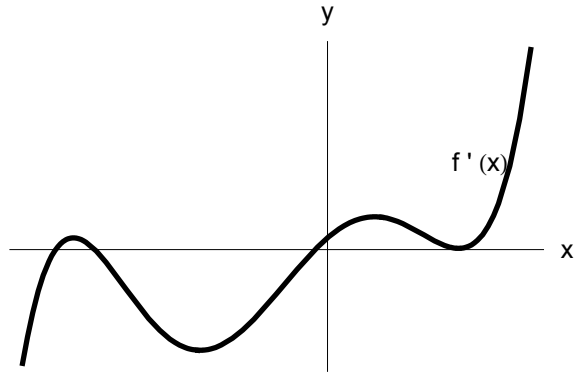
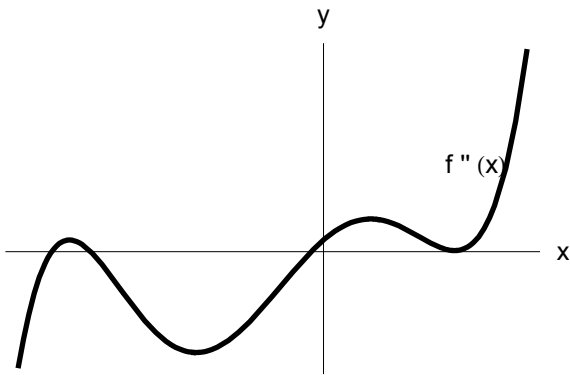


AP Calculus AB Review: Chapter 5

1. Indicate on the graph of the derivative of f' the x -values that are inflection points of the function f itself.



2. Indicate on the graph of the second derivative f'' the x -values that are inflection points of the function f itself.



3. Given $f(x) = x^3 - 6x^2 + 9x + 1$, $0 \leq x \leq 5$

(A) Find the first and second derivatives of f .

(B) State the intervals over which f is increasing and decreasing. Use a sign chart to justify your work.

(C) Find the local maxima and minima.

(D) Find the coordinates of any inflection points.

(E) State the intervals over which the graph of f is concave upward and concave downward. Use a sign chart to justify your work.

(F) Find the global maxima and minima over the given domain. Show your work.

4. The market research department of a company recommends that the company manufacture and market a new transistor radio. After suitable test marketing, the research department presents the following **price-demand equation**: $p = 10 - \frac{x}{1000}$, where x is the number of radios retailers are likely to buy at \$ p per radio. The financial department provides the following **cost function**: $C(x) = 7,000 + 2x$.

(A) Find the domain of the function defined by the price-demand equation.

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- (B) Find the marginal cost function $C'(x)$.
- (C) Find the revenue function as a function of x .
- (D) Find the marginal revenue function $R'(x)$.
- (E) Find the profit function in terms of x .
- (F) Find the marginal profit function $P'(x)$.
- (G) Find the maximum revenue.
- (H) Find the maximum profit **and** the price the company should charge to realize maximum profit.
- (I) Find the **break-even** points.