

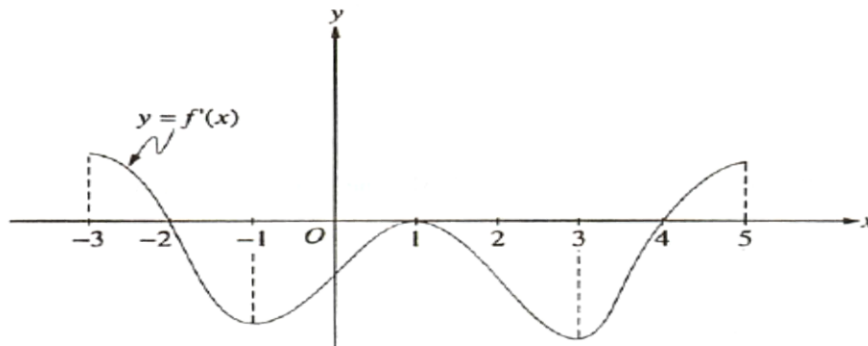
AP Calculus
3.1 - Group Assignment
Curve Analysis

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Name: _____

Please do each question on a separate sheet of paper. Each part of each question is worth 2 marks.
Justify all steps in a neat, logical, and organized manner using sentences to explain your thought process.

1. The graph of f' is given below and f is defined for all x such that, $-3 < x < 5$.



- a. For what value(s) of x does f have a relative maximum? Justify your answer.
 - b. For what value(s) of x does f have a relative minimum? Justify your answer.
 - c. On what interval(s) is the graph of f CU? Justify your answer.
 - d. Given that $f(1) = 0$, neatly sketch a possible graph of f on the open interval $(-1, 3)$.
2. Let $f(x) = 2\ln(x^2 + 3) - x$ with domain, $-3 \leq x \leq 5$. [Hint: Extensive use of nDeriv is required!]
- a. Find the x -coordinate of each relative extremum of f . Justify your answer.
 - b. Find the x -coordinate of each inflection point of f . Justify your answer.
 - c. Find the absolute maximum value of f . Justify your answer.
3. Let $f(x) = 4x^3 + ax^2 + bx + c$ where a , b , and c are constants. Determine the values of a , b , and c given the following properties of f :
- i. f has a local minimum at $x = -1$.
 - ii. f has a point of inflection at $x = -2$.
 - iii. $f(2) = 7$.
- [Hint: Systems of Equations]