

Snow Day Lesson #3

These are two free response questions from past AP tests. Answer each as completely as you can.

1. [1983 AB 3]

Let f be the function defined for $\frac{\pi}{6} \leq x \leq \frac{5\pi}{6}$ by $f(x) = x + \sin^2 x$.

- Find all values of x for which $f'(x) = 1$.
- Find the x -coordinates of all minimum points of f . Justify your answer.
- Find the x -coordinates of all inflection points of f . Justify your answer.

2. [1973 AB 3]

Given the curve $x + xy + 2y^2 = 6$.

- Find an expression for the slope of the curve at any point (x,y) on the curve.
- Write an equation for the line tangent to the curve at the point $(2,1)$.
- Find the coordinates of all other points on this curve with slope equal to the slope at $(2,1)$.

3. [1985 AB 1]

Let f be the function given by $f(x) = \frac{2x-5}{x^2-4}$.

- Find the domain of f .
- Write an equation for each vertical and each horizontal asymptote for the graph of f .
- Find $f'(x)$.
- Write an equation for the line tangent to the graph of f at the point $(0, f(0))$.