

Snow Day Lesson #2

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

1. [1989 AB 4]

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

- Find the domain of f .
- Write an equation for each vertical asymptote to the graph of f .
- Write an equation for each horizontal asymptote to the graph of f .
- Find $f'(x)$.

2. [1990 AB 5]

Let f be the function defined by $f(x) = \sin^2 x - \sin x$ for $0 \leq x \leq \frac{3\pi}{2}$.

- Find the x -intercepts of the graph of f .
- Find the intervals on which f is increasing.
- Find the absolute maximum value and the absolute minimum value of f . Justify your answer.

3. [1983 AB 2]

A particle moves along the x -axis so that at time t its position is given by $x(t) = t^3 - 6t^2 + 9t + 11$.

- What is the velocity of the particle at $t = 0$?
- During what time intervals is the particle moving to the left?
- What is the total distance traveled by the particle from $t = 0$ to $t = 2$?