

Math 150A, Section 2, Spring 2007
Homework Assignment 4

Name:

Show your work. No work, no credit.

1. Use the second derivative test to find the local minimum and maximum values of the function $f(x) = x - 2 \cos(x)$ on $[0, 2\pi]$. Then determine the inflection points.

2. Given the function $f(x) = x - 4\sqrt{x}$, find the intervals where f is increasing, decreasing, concave up, and concave down.

3. Sketch the graph of a function that satisfies

- $f(0) = f'(3) = 0$,
- $f'(x) < 0$ on $(0, 3)$, $f'(x) > 0$ on $(3, +\infty)$,
- $f''(x) > 0$ on $(0, 5)$, $f''(x) < 0$ on $(5, +\infty)$,
- $\lim_{x \rightarrow +\infty} f(x) = 0$,
- $f(-x) = f(x)$.

4. Find all critical numbers of the function $f(x) = \sin^2(x) - \sqrt{3}\sin(x)$ on the interval $[0, \pi]$. Then find the absolute minimum and maximum values of the function on the interval.

5. The critical numbers of the function $f(x) = x^4 - 4x^3 + 4x^2 + 1$ are $x = 0, 1, 2$. Use the second derivative test to determine if f has a local minimum or a local maximum at each critical number.

Pledged

Honor code: I have neither given nor received help on this assignment.