Math 199 CD2: Local Maxima and Minima, 1st and 2nd Derivative

October 14, 2021

1. State the second-derivative test for relative extrema

2. Find the critical numbers of $f(x) = x^2/(x-1)$ and determine whether they yield relative maxima, relative minima, or inflection points.

3. Find the critical numbers of $f(x) = x(x-1)^3$, and determine whether they yield relative maxima, relative minima, or inflection points.

4. Find the absolute maximum and minimum of the function $f(x) = 4x^2 - 7x + 3$ on the interval $[-2, 3]$

5. Find the absolute maximum and minimum (if they exist) of $f(x) = x/(x^2 + 1)^{3/2}$ on $[0, +\infty)$

6. Find the absolute maximum and minimum of $f(x) = 2\sin x + \sin(2x)$ on $[0, 2\pi]$. Specifically give the number of critical points