

Math U141 Fall 2007 Half Quiz 2.5 Prof. A. Iarrobino Name _____
Please show all work for full credit.

1, Consider the function $f = x^4 - 18x^2 + 200$.

- a. Find algebraically all critical points.
- b. Using SDT or a first derivative test, identify all local max, local min.
- c. Find all inflections points.
- d. Determine the (global) max,min of $y=f(x)$ on the interval $-5 \leq x \leq 4$. Include a table of (x,y) values to show your work.
- e. Give a graph of $y=f(x)$ on the interval $-5 \leq x \leq 4$.

2A. Find the derivative y' , for

i. $y = \sqrt{(x^2 - 3)^3}$

ii. $y = x^3 \cdot e^{2 \sin(3x)}$

2B. i. The function $f(x)$ is concave up at $x = a$ when the first derivative $f'(a)$ is _____, and the second derivative $f''(a)$ is _____.

ii. The derivative function y' has a maximum at $x=a$ when the original function y has a/an _____ at $x=a$, and $y''(a)$ is _____.

iii. Give the graph of a function $y=f(x)$ for $0 \leq x \leq 4$ whose first derivative has a minimum at $x=2$, and satisfies $f'(0) = 3$, $f'(2) = 1$, and $f'(3) = 5$.

(Hint: first graph the second derivative). You may assume $f(0)=3$.