

NAME: _____

MATH 12002

HOMEWORK #5 (18 pts)

SPRING 2009

SHOW ALL WORK FOR FULL CREDIT — PLEASE CIRCLE YOUR FINAL ANSWER
EXACT ANSWERS ONLY

1. (2 pts) Find all critical point(s) of $f(x) = x^{5/2} - x^{3/2} - x^{1/2}$.

2. (3 pts) Find the absolute maximum and absolute minimum of $f(x) = x^3 - 2x^2 - 4x + 4$ on the interval $[0, 3]$.

3. (3 pts) Find all local minimum(s) and local maximum(s) of $f(x) = \frac{1}{2}x^4 + \frac{2}{3}x^3 - 12x^2 + 7$.

Homework Score:

Course Grade:

18

329 =

4. (3 pts) Determine the intervals where $f(x) = \frac{1}{x^2 - 2x - 8}$ is increasing and where f is decreasing.

5. (3 pts) Determine the intervals where

$$f(x) = 2 \sin x - \frac{\sqrt{3}}{2}x^2, \quad 0 \leq x \leq 2\pi$$

is concave up and where f is concave down.

6. (4 pts) Sketch the graph of the function f that satisfies the given conditions:

$$f'(1) = f(1) = 0 \quad \lim_{x \rightarrow 3} f(x) = -\infty \quad \lim_{x \rightarrow -1^+} f(x) = -\infty$$

$$\lim_{x \rightarrow -\infty} f(x) = 4 \quad \lim_{x \rightarrow \infty} f(x) = -2$$

$$f'(x) > 0 \text{ for } x < -1 \text{ and } -1 < x < 1 \text{ and } x > 3$$

$$f'(x) < 0 \text{ for } 1 < x < 3$$

$$f''(x) > 0 \text{ for } x < -1$$

$$f''(x) < 0 \text{ for } -1 < x < 3 \text{ and } x > 3$$