

## MATH 122 WORKSHEET 8

Show all work for full credit.

1. Find where the function is increasing, decreasing, concave up, and concave down. Give your answers in interval notation.

$$f(x) = \frac{1}{4}x^4 - \frac{2}{3}x^3 - 2x^2 + 8x - 1$$

2. Identify the critical points of  $f(x)$ . Use the first derivative test to identify each as the location of a local maximum, local minimum, or neither.

$$f(x) = x^4 - 18x^2 + 17$$

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3. Determine the global maximum and global minimum of  $f(x)$  over the given interval.

$$f(x) = 4x^3 - 9x^2 - 120x + 52 \text{ over } [-4, 8]$$

4. Find the derivative  $f'(x)$ .

$$f(x) = \frac{2^x(3x^5 + 7x^2 - 4)}{x^2 - x - 12}$$

5. Find the derivative  $f'(x)$ .

$$f(x) = e^{5x^3+9x^2+1} + \sqrt[5]{2x^{10} - 4x^5 + 25}$$