

## MATH 122 WORKSHEET 8

Show all work for full credit.

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

$$f(x) = \ln x(2x^4 - 5x^2 + 3)$$

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

$$f(x) = \left( \frac{3x^5 + 4x^3 - 1}{x^6 - 3x^3 + 7} \right)^8$$

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

$$f(x) = (x^2 + 9x)^3(2x^6 - 8x^2)^{1/4}$$

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

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

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

$$f(x) = \frac{5^x(x^3 - 2x)}{8x - 3}$$

6. 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.

$$f(x) = x^3 - 2x^2 - 15x + 10$$

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

$$f(x) = x^3 - 12x^2 - 60x + 18$$