

## MATH 122 WORKSHEET 8

Show all work for full credit.

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

$$f(x) = 5^x(3x^6 - 5x^2 + 1)$$

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

$$f(x) = \left( \frac{2x^4 + 6x^2 - 7}{x^5 - 4x^3 + 1} \right)^5$$

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

$$f(x) = (x^3 + 5x)^4(4x^5 - 3x^2)^{1/3}$$

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

$$f(x) = \frac{\ln(4x - 3)}{\sqrt{10x^3 - 7x^2}}$$

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

$$f(x) = \frac{3^x(x^7 - 2x)}{9x - 1}$$

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.

$$f(x) = x^3 + x^2 - 8x + 15$$

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

$$f(x) = x^3 - 18x^2 + 60x + 20$$