

MATH 122 WORKSHEET 7

Show all work for full credit.

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

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

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

$$f(x) = (4x^7 + 6x^2 - 5)^5$$

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

$$f(x) = \ln(8x^5 + 3x^3 + 2)$$

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

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

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

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

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

$$f(x) = e^{5x^2+3x} + \sqrt[3]{2x^7 + 9x}$$

7. Find the equation of the tangent line to the graph of

$$f(x) = 5x^2 - 3x + 2 \text{ when } x = 3.$$

8. The fuel efficiency (in miles per gallon) of an average American compact car is

$$E(x) = -0.015x^2 + 1.12x + 10.2,$$

where x is the driving speed in miles per hour. At what speed is the fuel efficiency *decreasing* at a rate of 0.90 mpg/mph?