

MATH 122 WORKSHEET 7

Show all work for full credit.

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

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

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

$$f(x) = (3x^4 + 8x^2 - 7)^4$$

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

$$f(x) = \ln(5x^6 + 9x^3 + 3)$$

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

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

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

$$f(x) = \frac{1}{(8x^5 - 3x^3 + 1)^5}$$

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

$$f(x) = e^{7x^2+2x} + \sqrt[4]{4x^7 + 3x}$$

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

$$f(x) = 7x^2 - 4x + 1 \text{ when } x = 3.$$

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

$$E(x) = -0.015x^2 + 1.114x + 8.8,$$

where x is the driving speed in miles per hour. At what speed is the fuel efficiency *decreasing* at a rate of 0.95 mpg/mph?