

MATH 135 – Calculus 1  
Review on Differentiation Rules  
December 9, 2019

*Practice Problems*

For each of the following functions, compute the derivative  $\frac{dy}{dx}$ :

1. State the Product, Quotient, and Chain Rules for derivatives. (You should be prepared to do this on an exam as well.)

2.

$$y = 5x^{1/3} - \frac{x^3 + 7x}{\sqrt{x}}$$

3.

$$y = \sin(x)e^{-6x}$$

4.

$$y = \frac{\tan(x)}{\ln(x)}$$

5.

$$y = (x - 3) \cos(x^4 + 3x^2 + 1)$$

6.

$$y = \sin^{-1}(e^x + 3)$$

7.

$$xy^3 + 4x^2 + 3y - 2x = xy$$

8. What is the equation of the tangent line to the curve defined by the equation in the previous problem at the point  $(0, 0)$ ?