Name:
Section 3.4 – In class examples
Math 151 – Spring 2018
Section 3.4

1. Find the derivative of each of the following functions

   (a) $f(t) = t\ln(t)$

   Product Rule: $1 \cdot \ln(t) + \dfrac{1}{t} \cdot t$

   (b) $f(t) = \dfrac{5t^2}{t^4+1}$

   Quotient Rule: $\dfrac{(t^4+1)\cdot 10t - 5t^2 \cdot 4t^3}{(t^4+1)^2}$

2. A demand curve for a product has the equation $p = 80e^{-0.003q}$, where p is price and q is quantity sold.

   (a) Find the revenue as a function of quantity sold

   $$\begin{aligned} \text{Revenue} &= \text{price} \cdot \text{quantity} \\ R(q) &= 80e^{-0.003q} \cdot q \end{aligned}$$

   (b) Find the marginal revenue function.
   The Marginal Revenue is $R'(q)$ so we can use the product rule as follows:

   $$R'(q) = q \cdot (80 \cdot (-0.003e^{-0.003q})) + 80e^{-0.003q} \cdot 1$$