Chapter 3.4: Practicing the Chain Rule
Calculus I
College of the Atlantic. Fall 2016

1. Take the derivative of the following functions:

   (a) $f(x) = e^{3x}$

   (b) $f(x) = 3e^{3x}$

   (c) $f(x) = x^3 e^x$

   (d) $f(x) = e^{x^3}$

   (e) $f(x) = x^3 e^{x^3}$

   (f) $f(x) = x^3 + e^{x^3}$

2. The length L of a metal rod depends on temperature T such that the length increases by 2.5 cm for every degree increase in temperature. If the temperature is increasing at 4° per hour, how fast is the length of the metal rod increasing?

3. A circular oil slick is growing. At a certain moment the radius is 7 km and the radius is growing at a rate of 0.2 km/hr. How fast is the area of the oil slick growing at this moment?

4. $f(x) = \sqrt{1 + x^3}$. Calculate $f'(3)$ and $f'(5)$. Which is bigger, and why? Is $f(x)$ concave up or concave down?