MATH 10250 Homework 4

1. Show that if $f(x)$ is a differentiable function, then

$$\frac{d}{dx}\left(e^{f(x)}\right) = e^{f(x)}f'(x)$$

by applying the Chain Rule.
Hint: You need to view $e^{f(x)}$ as a composition of functions.

2. Show that if $f(x)$ is a differentiable function, then

$$\frac{d}{dx}\left(\ln(f(x))\right) = \frac{f'(x)}{f(x)}$$

by applying the Chain Rule.

3. Suppose a is a constant and $f(x)$ is a differentiable function. Find

$$\frac{d}{dx}\left(a^{f(x)}\right)$$