1. Evaluate the expressions,
   (a) \( \log_8 320 - \log_8 5 \)
   (b) \( 4^{\log_2 6} \)

2. Order the following numbers from least to greatest. I think you should be able to do this without a calculator; if it helps \( e \approx 2.71828 \) and \( \sqrt{10} \approx 3.16278 \).
   (a) \( 5^{\sqrt{10}} \)
   (b) \( (5^{10})^{\frac{1}{2}} \)
   (c) \( \ln (5^{10}) \)
   (d) \( \log_2 (5^{10}) \)
   (e) \( \log_{10} (5^{10}) \)
3. Differentiate the following functions.
(a) \( f(\theta) = 2^{\cos \theta} \)

(b) \( g(x) = x^{\frac{1}{x}} \)

4. Evaluate the following integrals.
(a) \( \int x^3 + 3^x \, dx \)

(b) \( \int_0^1 \frac{2^t}{1 + 2^t} \, dt \)