

1. (5 pts.) Differentiate  $f(x) = x^{\sin x}$

2. (5 pts.) Differentiate  $f(x) = \ln(3t e^{-t})$

3. (5 pts.) Evaluate the integral  $\int_1^e \frac{\ln x^2}{x} dx$

4. (5 pts.) Money in a bank account grows continuously at a rate of 10% per year. Suppose \$100 is put into the account in 1970.

What equation would you use to determine the amount of money in the account in 1996?