1. Find the derivative of each of the following functions

   (a) \( f(t) = (t^2 + 1)^{100} \)

   (b) \( f(t) = 6e^{5t} + e^{-t^2} \)

2. Find the relative rate of change \( \frac{f'(t)}{f(t)} \) for \( f(t) = \ln(t^2 + 1) \) at \( t = 2. \)

3. If you invest \( P \) dollars in a bank account at an annual interest rate of \( r\% \), then after \( t \) years you will have \( B \) dollars, where

   \[
   B = P \left(1 + \frac{r}{100}\right)^t
   \]

   (a) Find \( \frac{dB}{dt} \), assuming \( P \) and \( r \) are constant. In terms of money, what does \( \frac{dB}{dt} \) represent?

   (b) Find \( \frac{dB}{dr} \), assuming \( P \) and \( t \) are constant. In terms of money, what does \( \frac{dB}{dr} \) represent?