

M104, Practice Quiz 5

This practice quiz does not count for points, but I will use some of these problems as models which I'll follow for the real Quiz 5 on Wednesday, February 20, 2013.

- (1) Determine which of the following investments is best and which is worst. Explain how you obtained your answer.
 - (a) Assume continuous compounding at an interest rate $r = 8\%$.
 - (b) Assume semiannual compounding at an interest rate $r = 8.1\%$.
 - (c) Assume a doubling time of 8.65 years.

- (2) Find $\frac{dy}{dx}$ for $y = e^{x^2}$, and find $\frac{dy}{dx}$ for $y = (e^x)^2$.

- (3) Find $\frac{dy}{dx}$ for $y = \ln(x^2)$, and find $\frac{dy}{dx}$ for $y = (\ln(x))^2$.

- (4) According to the UN, world population (in millions) t years after 1960 is approximately given by $P = 3100e^{0.0166t}$. Find the rate of growth in 1960 (in millions of people per year) and find the rate of growth now. Also, find the doubling time.