BEE1020 – Basic Mathematical Economics	Juliette Stephenson Amr Algarhi
Homework **Week 6**	Department of Economics University of Exeter

You must submit your solutions by Monday 5pm at the reception.

Please do not forget to write your name and your tutorial group (name of tutor, day of week, time) on your answer sheet.

Problem 1 *Bank A offers the interest rate of 7% compounded annually. Bank B offers the annual interest rate 6.8% compounded continuously. Where should you open the account?*

In order for money to double in 5 years what would the nominal annual interest rate have to be if interests were paid a) continuously b) monthly or c) yearly?

Problem 2 *Differentiate the functions*

$$a)\ y = 3e^{1-4x} \qquad b)\ y = e^{\frac{1}{x^2}} \qquad c)\ y = \frac{\ln x}{x} \qquad d)\ y = 2^x \ln x$$

Problem 3 *Use logarithmic differentiation to find the derivative of*

$$a)\ y = \sqrt[4]{\frac{2x+1}{1-3x}} \qquad b)\ y = x^{1-x^2}$$

Problem 4 *A consumer has the utility function*

$$u(x, y) = \ln\left(x^{\frac{1}{6}} y^{\frac{2}{3}}\right)$$

a) Simplify the utility function and find its two partial derivatives.

b) If a unit of commodity x costs £1 and each unit of commodity y costs £4, how much would the consumer buy in optimum of both commodities if he had a budget of £100 available?