Queen Mary
University of London

MTH4101 Calculus II, Spring 2013

Problem sheet for Tutorial 4

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- The questions are designed to help you with material covered in Week 4 and 5. You will get help with them in the tutorial on 7 or 8 February.
- You should write up your solution to the starred question (*) clearly and hand it in to your personal tutor in your assigned tutorial on 14 or 15 February for feedback. *Remember to put your full name and student number on the top of your solution.* Your marked solution to the feedback question will be returned to you in your tutorial on 28 February or 1 March.
- It is important that you try to do all of the questions.

1: Obtain the limit as $n \to \infty$ for each of the following sequences:

$$(a) \quad a_n = \left(1 + \frac{x}{n}\right)^n$$

$$(b) \quad a_n = \frac{n^2}{2n-1} \sin\frac{1}{n} \, .$$

(*) 2: Obtain the limit as $n \to \infty$ for each of the following sequences:

$$(a) \quad a_n = \left(\frac{3n+1}{3n-1}\right)^n$$

$$(b) \quad a_n = \frac{1}{n} \int_1^n \frac{1}{x} \, dx \, .$$

3: Obtain the limit as $n \to \infty$ for each of the following sequences:

$$(a) \quad a_n = \frac{\ln(n+1)}{\sqrt{n}}$$

$$(b) \quad a_n = \frac{n!}{n^n}$$

$$(c) \quad a_n = n \ln\left(1 + \frac{7}{n}\right) \, .$$