PHAS1245 : Mathematical Methods I—Problem Sheet 9

(Solutions to be handed in at the lecture on Friday 17$^{\text{th}}$ December 2010)

Staple your answer sheets together and put **your name** and your **Problem Solving Tutorial group (number, day and time)** on your script.

1. Sum the even numbers between 1000 and 2000 (including 1000 and 2000). **[3]**

2. If you invest £ 1000 on the first day of each year and interest is paid at 5% on your balance at the end of each year how much money do you have after 25 years ? **[3]**

3. Find the first three non-zero terms in the Maclaurin series for the following functions : **[6]**

   (a) $(x^2 + 9)^{-1/2}$;

   (b) $e^{\sin x}$;

   (c) $\ln(\cos x)$.

4. Obtain the Maclaurin series for the following functions : **[8]**

   (a) $\ln(1 + x)$;

   (b) $\ln\left(\frac{1+x}{1-x}\right)$.