MTH 34, Homework 4 on sections 3.1, 3.2, 3.3, 3.4

Write all your working out and answers on your own notepaper - no need to write the questions. Please use lots of space.

It is very important that you show clearly any work you had to do to get your answers. Just writing the answer down with no work shown is usually not enough.

These questions from the textbook are worth 3 points each for a total of 30:

(1) Page 144, Question 4

(2) Page 144, Question 10

(3) Page 155, Question 4

(4) Page 155, Question 9

(5) Page 156, Question 25

(6) Page 156, Question 30, *(See hint below.)*

(7) Page 164, Question 1

(8) Page 164, Question 21

(9) Page 172, Question 2

(10) Page 174, Question 24, *(See hints below.)*

Homework should be handed in the week after it is assigned. Late homework will only receive partial credit.

If you understand the homework questions then you will be able to do the exam questions. You should also try the other questions listed on the syllabus to get extra practice. For any difficulties with the homework, please talk to me after class, come to my office hours or try the Math Tutorial Lab: CP 303.

For question (6), remember the formula from Mth 32 (Calculus II) for $\int \tan(t)\,dt$.

For question (10) we use the reduction of order method and assume that there is a function $v = v(t)$ so that $vy_1 = vt$ is another solution to the differential equation. Substitute $y = vt$ and show that this means

$$tv'' + 4v' = 0.$$

Let $w = v'$ to get $tw' + 4w = 0$. Solve this separable first order equation to obtain $w = Ct^{-4}$. Then use the antiderivative of w to find v and then y_2, the second solution.