MA1506 Mid-term Test Information

General Information

Date: Monday 26 Sep 2011

Time: 2:00 pm to 4:00 pm.

Venue: MPSH1A

Topics: Chapters 1 and 2

Format: 5 questions (please see the sample test.)
             Candidates only have to write their answers (without workings) on the cover sheet and only the answers (not the workings) will be graded.

The test will be 'closed-book'.
Only 1 A4, double-sided, handwritten help sheet is allowed.

Bring matriculation card, calculator(s).
Only non-programmable, non-graphing calculators will be allowed.

Rough paper for calculations will be provided.

The seating plan will be announced later in the Workbin.

During the Test

All examination rules must be strictly followed during the test. In particular, students must not start writing before they are told to do so. They must not communicate with each other during the test. When the chief invigilator announces that the test has ended, students must stop writing immediately. Students caught breaking any examination rules will be referred to the Registrar's Office to face disciplinary action.

If you miss the Test

Students who miss the test without a valid MC or written permission from the lecturer will receive zero mark for CA.

Students who miss the test with a valid MC should e-mail the lecturer at matqts@nus.edu.sg by Wednesday 28 September 2011 to inform him of their valid MC. As students taking the make-up test will have more days for their preparation, the make-up test will be proportionally more difficult and cover more chapters than the mid-term test

MA1506 Mathematics II
Mid-term Test (Sample)
Answer Sheet

Seat Number:

Matriculation Number:

Name (Block Letters) :

Write down (in ink) your answers in the boxes provided.

Question	Answer	Examiner's Use Only
1		
2		
3		
4		
5		
Total		

Answer all the questions and enter your answer on the answer sheet. Answers have to be written in ink.

1 Let y(x) be the solution of the differential equation
$$y'' + 4y - 12x = 0, \qquad y(\pi) = 5 + 3\pi, \quad y'(\pi) = 7.$$
Find the value of $y'(0)$.

2. Let y(x) be the solution of the differential equation
$$y' + y - y^3 = 0, \qquad y(0) = 1$$
Evaluate y(100).

3. A tank initially contains 50 litres of pure water. A solution containing 2g per litre of salt is pumped into the tank at the rate of 3g per minute. The mixture is stirred Constantly and flows out at same rate of 3g per minute. Find the amount of salt in the tank after a long time.

4. An undamped mass spring oscillator of mass 1kg is pulled down from its equilibrium position and released from rest. Given that the period is 2 seconds, find the spring constant.

5. A particle moves along the x-axis with equation of motion
$$\ddot{x} + 6\dot{x} - 16x = 0$$
At t=0 sec the particle is at x=2m and moving to the left with a velocity of 10m/s. When will the particle change direction and go to the right?