Faculty: Mathematics  
Course: Mathematics Extension 1 Year: 12

Assessment Task: 4

Assessment Weighting: 20%  
Due: Term 3 Week 4  
Date: Thursday 15th August 2019

Task Type: Hand in Task  
In Class Task  
Practical Task  

Outcomes assessed (NESA)
HE3, HE4, HE5, HE7

PLEASE NOTE: Further information related to these codes can be found on the NESA website

Task Description/Overview
This in class written test will consist of multiple choice and short answer questions
Time allowed: 90 Minutes (2 periods)
Equipment required: Black pen and NESA approved calculator

Detailed Assessment Task Description

Binomial Theorem
- Expansion of \((a + x)^n\) for \(n = 2, 3, 4 \ldots\)
- Proof of the Pascal Triangle relations.
- Relationships between binomial coefficients.

Inverse functions and inverse trigonometric functions
- Graphs of inverse functions, including \(\sin^{-1} x\), \(\cos^{-1} x\), \(\tan^{-1} x\).
- Differentiation and integration of inverse trigonometric functions.

Applications of Calculus to the Physical World
- Related rates involving the equation \(\frac{dN}{dt} = k(N - P)\), where \(k\) is the population growth constant and \(P\) is a population constant.
- Velocity and acceleration as functions of \(x\).
- Simple harmonic motion
- Projectile motion

Integration of \(\sin^2 x\) and \(\cos^2 x\)

Test/Examination Structure

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<tr>
<th>Section Description</th>
<th>Marks Available</th>
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<td>Section I</td>
<td>10</td>
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<td>Objective response questions</td>
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<td>Section II</td>
<td>45</td>
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| There will be three questions each worth 15 marks.  
Each question will consist of a number of short-answer parts. |

Total Marks for this task 55

Satisfactory completion of courses
A course has been satisfactorily completed, when the student has:
- Followed the course developed/endorsed by the NSW Educational Standards Authority (NESA)
- Applied himself/herself with diligence and sustained effort to the set tasks and experiences provided in the course.
- Achieved some or all of the course outcomes