YEAR 12 EXTENSION 1
ASSESSMENT TASK
TERM 3, WEEK 2, 2010

Date: Thursday, 29th July **Marks: 100%**
Time Allowed: 1 period **Weighting: 10%**

Outcomes Addressed

- Applies techniques of calculus to solve problems relating to the physical world.
- Uses a variety of strategies to investigate mathematical models of situations involving binomial theory.

Applications of Calculus to the Physical World

- Velocity as a function of position.
- Acceleration as a function of position. $\left[a = v\frac{dv}{dx} = \frac{d}{dx}\left(\frac{1}{2}v^2\right)\right]$
- Parabolic motion under gravity i.e. projectiles.
- Simple harmonic motion.

Binomial Theorem

- Binomial expansions using ${}^nC_r$.
- Finding the coefficient of specific term without expanding the binomial.
- Definition of ${}^nC_r$.
- Equidistant coefficients result.
- Pascal's triangle result.
- Application of $U_{r+1} = {}^nC_r a^{n-r}x^r$.
- Equating coefficients.
- Greatest coefficient,
- Relationships between binomial coefficients.

Instructions

- Attempt all questions
- Show all necessary working
- Write in blue pen, black pen or dark pencil
- Approved calculators may be used

NOTE:

- Students who do not achieve the outcome (less than 39%) in this assessment task will receive an 'Official Warning' – non completion of the HSC course.
- Students will be required to re-sit the task within 7 days.
- Students will be given 2 further opportunities to achieve the required outcome.
- Failure to achieve the outcome may result in the student receiving an 'N' determination.