KILLARA HIGH SCHOOL

MATHEMATICS 2/3 UNIT COURSE

YEAR 11 TERM 4 EXAMINATION , DECEMBER 2001

TIME ALLOWED: 60 minutes Total: 60 marks

TOPICS

THE TANGENT AND DERIVATIVE
LOCUS AND THE PARABOLA
GEOMETRICAL APPLICATIONS OF CALCULUS
SERIES AND SEQUENCES

Attempt all questions.
Approved calculators may be used.
Show all working clearly.
Answers without appropriate working may not be awarded marks.
Marks may be deducted for untidy or poorly set out work.
Write solutions on one side of the paper only.
Begin each question on a new page.

Marks

Question 1 (20 marks) **Start a new page**

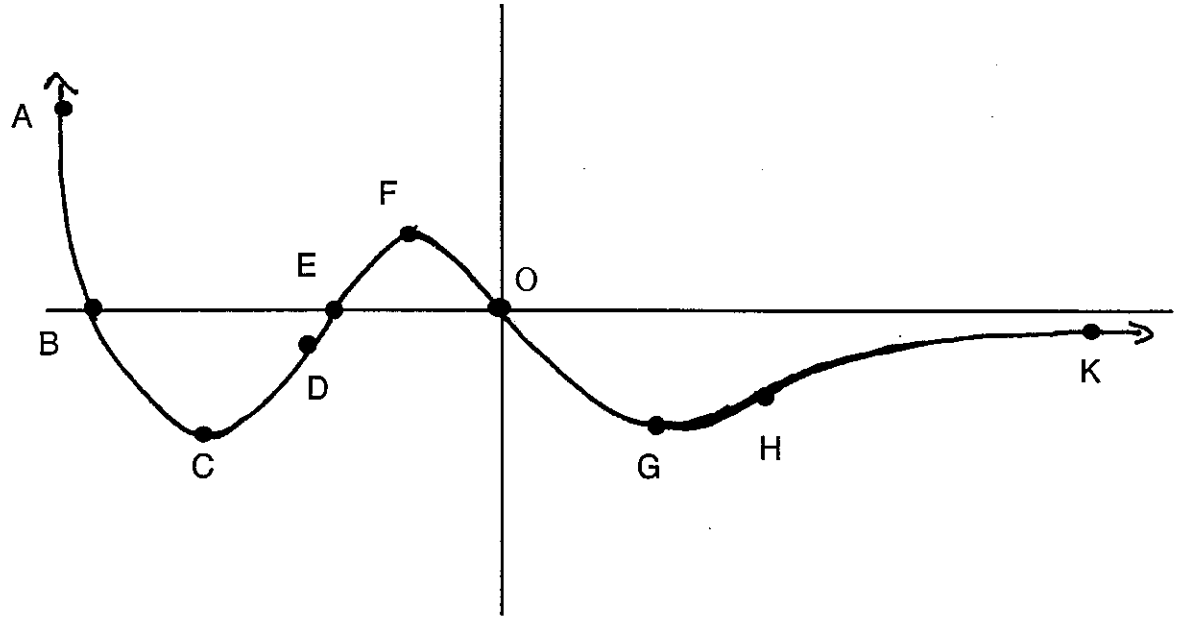
[2] i) Differentiate $y = x^2$ from first principles.

[2] ii) Use the product rule to differentiate $y = x^2\left(2x^3 + 3\right)$

[2] iii) Use the quotient rule to differentiate $y = \dfrac{3x + 4}{4x + 3}$

[2] iv) Differentiate $f(x) = \left(2x^3 - 3\right)^{\frac{1}{2}}$

Question 4 (9 marks) Start a new page



Use the above graph to write down those points which have the condition specified in the following table:

	$y = 0$	$\frac{dy}{dx} = 0$	$\frac{d^2y}{dx^2} = 0$	$y > 0$	$y < 0$	$\frac{dy}{dx} < 0$	$\frac{dy}{dx} > 0$	$\frac{d^2y}{dx^2} < 0$	$\frac{d^2y}{dx^2} > 0$
Points									
	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]

The same point may appear in the table more than once.
All appropriate points must be written in the table for the mark to be allocated.