

FUKIEN SECONDARY SCHOOL
S6 First Term Uniform Test (2020-2021)
Mathematics Extended Part Module 2
(1 hour 15 minutes)

Date: 22nd October 2020

Name: _____

Time: 10:15a.m. - 11:30a.m.

Class: _____ No.: _____

Instructions to students:

1. This paper consists of TWO sections, A and B. The full score is 45.
2. Attempt ALL questions in Section A and Section B.
3. Write your answers in the spaces provided.
4. Unless otherwise specified, show your workings clearly.
5. Unless otherwise specified, numerical answers must be exact.
6. The diagrams in this paper are not necessarily drawn to scale.

FORMULAS FOR REFERENCE

$\sin (A \pm B) = \sin A \cos B \pm \cos A \sin B$	$\sin A + \sin B = 2 \sin \frac{A+B}{2} \cos \frac{A-B}{2}$
$\cos (A \pm B) = \cos A \cos B \mp \sin A \sin B$	$\sin A - \sin B = 2 \cos \frac{A+B}{2} \sin \frac{A-B}{2}$
$\tan (A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$	$\cos A + \cos B = 2 \cos \frac{A+B}{2} \cos \frac{A-B}{2}$
$2 \sin A \cos B = \sin (A+B) + \sin (A-B)$	$\cos A - \cos B = -2 \sin \frac{A+B}{2} \sin \frac{A-B}{2}$
$2 \cos A \cos B = \cos (A+B) + \cos (A-B)$	
$2 \sin A \sin B = \cos (A-B) - \cos (A+B)$	

1. Let $f(x) = \cos x$. Find $f'(\pi)$ from first principles.

(4 marks)

[illegible]

2. Find the constant term in the expansion of $\left(x^2 + \frac{1}{2\sqrt{x}}\right)^{10}$.

(4 marks)

[illegible]

3. Find the equation of tangent to the curve $x^2 + x\sqrt{y+1} = 2$ at the point where the curve cuts the positive x -axis.

(5 marks)

[illegible]

- (6 marks)

[illegible]

[illegible]

6. Consider the system of linear equations in real variables x, y, z

$$(E): \begin{cases} x - y - z = \beta \\ 2x + \alpha y + \alpha z = 2\beta \\ 5x + (\alpha - 2)y + (2\alpha + 3)z = 7\beta \end{cases}, \text{ where } \alpha, \beta \in \mathbf{R}.$$

- (a) Assume that (E) has a unique solution.
 - (i) Find the range of values of α .
 - (ii) Express y in terms of α and β .
- (b) Assume that $\alpha = -5$. If (E) is inconsistent, find the range of values of β .

(7 marks)

[illegible]

This image shows a full page of white paper with horizontal dashed lines, typical of primary school writing paper. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

[illegible]

End of Test