

GHS F4 M2 Ch4 Trigonometry (II) Quiz

S4M2

S4 Math Extended Module (M2)

Parent's Signature:

Time allowed: 35 min

Quiz 05

Score: / 25

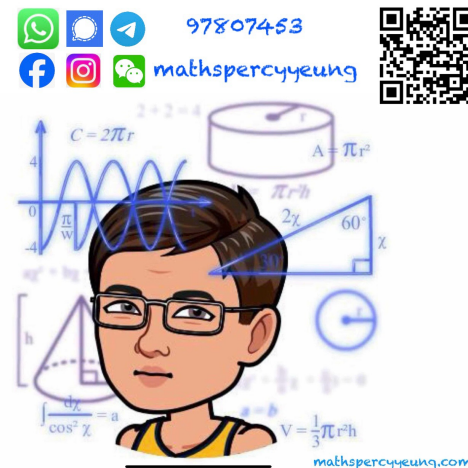
Chapter 4 Trigonometry II

Name: _____ Class: _____ () Date: _____

A. Compulsory Section (20 marks)

Instruction: Complete all the questions in this section on the given blank.

1. It is given that $\cot(\pi + \alpha) = 3$ and $\cos(\pi - \beta) = \frac{4}{5}$, where β lies in quadrant III. Find the value of $\tan(\alpha + \beta)$ without using a calculator. (4 marks)



2. Prove that $\frac{\cos(6\alpha + \beta)}{\sin 3\alpha} + 2\sin(3\alpha + \beta) = \frac{\cos \beta}{\sin 3\alpha}$.

(3 marks)

3. Solve the equation $\tan 6x - \tan 2x - \tan 6x \tan 2x = 1$, where $0 \leq x < \pi$. (3 marks)

5. Prove that $\cos 4\theta \cos 2\theta - \sin 8\theta \sin 6\theta = \cos 10\theta \cos 4\theta$.

(3 marks)

7. Prove, by mathematical induction, that for all positive integers n ,

$$\sin 2x \sin 4x + \sin 2x \sin 8x + \sin 2x \sin 12x + \cdots + \sin 2x \sin 4nx = \frac{1}{2} \cos 2x - \frac{1}{2} \cos(4n+2)x.$$

(5 marks)

B) Bonus Section (3 marks)

Instruction: You may complete the following optional question. It is **NOT** compulsory.

If $A + B + C = \pi$, prove that $\cos A + \cos B - \cos C = 4 \cos \frac{A}{2} \cos \frac{B}{2} \sin \frac{C}{2} - 1$. **(3 marks)**