

Trig. Equations

Question Paper 1

Level	A Level
Subject	Maths
Exam Board	OCR - MEI
Module	Core 4
Topic	Trigonometry
Sub Topic	Trig. Equations
Booklet	Question Paper 1

Time Allowed: 51 minutes

Score: /42

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

1 Express $6 \cos 2\theta + \sin \theta$ in terms of $\sin \theta$.

Hence solve the equation $6 \cos 2\theta + \sin \theta = 0$, for $0^\circ \leq \theta \leq 360^\circ$. [7]

2 (i) Show that $\cos(\alpha + \beta) = \frac{1 - \tan \alpha \tan \beta}{\sec \alpha \sec \beta}$. [3]

(ii) Hence show that $\cos 2\alpha = \frac{1 - \tan^2 \alpha}{1 + \tan^2 \alpha}$. [2]

(iii) Hence or otherwise solve the equation $\frac{1 - \tan^2 \theta}{1 + \tan^2 \theta} = \frac{1}{2}$ for $0^\circ \leq \theta \leq 180^\circ$. [3]

3 Given the equation $\sin(l + 45^\circ) = 2 \cos l$, show that $\sin l + \cos l = 2 \cos l$. Hence

solve, correct to 2 decimal places, the equation for $0^\circ \leq l \leq 360^\circ$.

$\leq \leq$

[6]

4 Solve the equation $\tan(\theta + 45^\circ) = 1 - 2 \tan \theta$, for $0^\circ \leq \theta \leq 90^\circ$. [7]

5 Given that $\sin(\theta + \alpha) = 2 \sin \theta$, show that $\tan \theta = \frac{\sin \alpha}{2 - \cos \alpha}$.

Hence solve the equation $\sin(\theta + 40^\circ) = 2 \sin \theta$, for $0^\circ \leq \theta \leq 360^\circ$. [7]

6 Solve the equation $2 \cos 2x = 1 + \cos x$, for $0^\circ \leq x < 360^\circ$. [7]