TRIGONOMETRY (Q 4 & 5, PAPER 2)

LESSON NO. 5: TRIG IDENTITIES

2005

4 (b) (i) Using $\cos 2A - \cos^2 A - \sin^2 A$, or otherwise, prove $\cos^2 A = \frac{1}{2}(1 + \cos 2A)$.

2004

4 (b) (i) Prove that $\cos 2A = \cos^2 A - \sin^2 A$. Deduce that $\cos 2A = 2\cos^2 A - 1$.

5 (b) (i) Show that $(\cos x + \sin x)^2 + (\cos x - \sin x)^2$ simplifies to a constant.

(ii) Express $1 - (\cos x - \sin x)^2$ in the form $a \sin bx$, where $a, b \in \mathbf{Z}$.

2002

5 (b) (i) Prove that $\tan(A + B) = \dfrac{\tan A + \tan B}{1 - \tan A \tan B}$.

2001

5 (c) A is an obtuse angle such that $\sin\left(A + \dfrac{\pi}{6}\right) + \sin\left(A - \dfrac{\pi}{6}\right) = \dfrac{4\sqrt{3}}{5}$.

(i) Find $\sin A$ and $\tan A$.

(ii) Given that $\tan(A + B) = \frac{1}{2}$, find $\tan B$ and express your answer in the form $\frac{p}{q}$ where $p, q \in \mathbf{Z}$ and $q \neq 0$.

ANSWERS

2004 5 (b) (i) 2 (ii) $\sin 2x$

2001 5 (c) (i) $\frac{4}{5}, -\frac{4}{3}$ (ii) $\frac{11}{2}$