11 (a) Express the equation

$$3\sin(A - B) = \sin(A + B)$$

in the form $\tan A = k\tan B$, giving the value of the integer k.

(4)

(b) Given that $\theta \neq \frac{(2n+1)\pi}{2}$ where $n \in \mathbb{Z}$,

show that $\frac{\cos^4\theta - \sin^4\theta}{\cos^2\theta} = 1 - \tan^2\theta$

(3)

(c) Using the exact values of $\sin x°$, $\cos x°$ and $\tan x°$ for $x = 30, 45, 60$

show that

(i) $\cos 15° = \frac{\sqrt{6} + \sqrt{2}}{4}$

(2)

(ii) $\tan 255° = \frac{3 + \sqrt{3}}{3 - \sqrt{3}}$

(4)

Question 11 continued

Question 11 continued

(Total for Question 11 is 13 marks)

TOTAL FOR PAPER IS 100 MARKS