5 (a) Show that $\cos(A - B) - \cos(A + B) = 2\sin A \sin B$

(2)

(b) Hence express $2\sin 5x \sin 3x$ in the form $\cos mx - \cos nx$ where m and n are integers, giving the value of m and the value of n,

(1)

(c) (i) Find $\int 4\sin 5\theta \sin 3\theta \, d\theta$

(ii) Hence evaluate $\int_0^{\frac{\pi}{6}} 4\sin 5\theta \sin 3\theta \, d\theta$, giving your answer in the form $\frac{a\sqrt{b}}{c}$ where a, b and c are integers.

(4)

Question 5 continued

(Total for Question 5 is 7 marks)