8 (a) Write down the value of k such that $\sin 2A = k \sin A \cos A$

(1)

$$g(A) = 2 + 3\cos A - \sin A - 3\sin 2A - 2\cos^2 A$$

Given that $g(A)$ can be written in the form $(p\cos A - \sin A)(q - r\sin A)$ where p, q and r are integers,

(b) find the value of p, the value of q and the value of r.

(3)

(c) Hence solve, in radians to 3 significant figures where appropriate, the equation

$$g(2\theta) = 0 \quad \text{for} \quad 0 \leqslant \theta < \pi$$

(6)

Question 8 continued

Question 8 continued

Question 8 continued

(Total for Question 8 is 10 marks)