1. Solve the equation $2 \cos^2 x = \sin 2x$ for $0 \leq x \leq \pi$, giving your answers in terms of π.

(Total 6 marks)

2. Solve the equation $2\cos x = \sin 2x$, for $0 \leq x \leq 3\pi$.

(Total 7 marks)

3. (a) Show that $4 - \cos 2\theta + 5 \sin \theta = 2 \sin^2 \theta + 5 \sin \theta + 3$.

(2)

(b) **Hence**, solve the equation $4 - \cos 2\theta + 5 \sin \theta = 0$ for $0 \leq \theta \leq 2\pi$.

(5)
(Total 7 marks)

4. Solve $\cos 2x - 3 \cos x - 3 - \cos^2 x = \sin^2 x$, for $0 \leq x \leq 2\pi$.

(Total 7 marks)

5. Consider the equation $3 \cos 2x + \sin x = 1$

(a) Write this equation in the form $f(x) = 0$, where $f(x) = p \sin^2 x + q \sin x + r$, and p, q, r $\in \mathbb{Z}$.

(b) Factorize $f(x)$.

(c) Write down the number of solutions of $f(x) = 0$, for $0 \leq x \leq 2\pi$.

(Total 6 marks)