(b) Determine the number of solutions in the interval $0 \leqslant x \leqslant 2\pi$ of each of the following equations.

(i) $3\sin x + 2 = x$ [1]

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(ii) $3\sin x + 2 = 5 - x$ [1]

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(c) Solve the equation $3\sin x + 2 = 5\cos^2 x - 1$ for $0 \leqslant x \leqslant 2\pi$. [5]

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