2. **In this question you must show all stages of your working.**
Solutions relying entirely on calculator technology are not acceptable.

(i) Solve, for $0 < x \leqslant 2\pi$, the equation

$$1 + \sin^2 x + \cos x = 0$$

(3)

(ii) Solve, for $0 < \theta < 180°$, the equation

$$\sin(\theta + 60°) = 4\cos(\theta + 60°)$$

giving the answer to one decimal place.

(3)

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Question 2 continued

(Total for Question 2 is 6 marks)

3. The first four terms of a sequence are

$$3,\ -6,\ u_3,\ -24,\ ...$$

(a) Decide, showing detailed reasoning, whether the sequence could be

(i) an arithmetic sequence,

(ii) a geometric sequence.

State, for each part, the value of u_3 if such a sequence is possible.

(6)

(b) Given instead that

- the sequence is periodic of period 4
- $\sum_{i=1}^{50} u_i = 141$

find the value of u_3

(3)

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