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

In an arithmetic series,

- the sixth term is 2
- the sum of the first ten terms is –80

For this series,

(a) find the value of the first term and the value of the common difference.

(4)

(b) Hence find the smallest value of n for which

$$S_n > 8000$$

(3)

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Question 2 continued

(Total for Question 2 is 7 marks)

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

(i) Using the laws of logarithms, solve

$$2\log_2(2-x) = 4 + \log_2(x+10)$$

(5)

(ii) Find the value of

$$\log_{\sqrt{a}} a^6$$

where a is a positive constant greater than 1

(1)

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