1. (a) Find the first four terms, in ascending powers of x, of the binomial expansion of

$$\left(1-\frac{1}{6}x\right)^9$$

giving each term in simplest form.

(3)

(b) Hence find the coefficient of x^3 in the expansion of

$$(10x+3)\left(1-\frac{1}{6}x\right)^9$$

giving the answer in simplest form.

(2)

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Question 1 continued

(Total for Question 1 is 5 marks)

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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