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

An arithmetic series has first term a and common difference d.

Given that the sum of the first 9 terms is 54

(a) show that

$$a + 4d = 6$$

(2)

Given also that the 8th term is half the 7th term,

(b) find the values of a and d.

(4)

(Total for Question 1 is 6 marks)

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

A sequence is defined by

$$u_1 = 3$$

$$u_{n+1} = 2 - \frac{4}{u_n} \quad n \geqslant 1$$

Find the exact values of

(a) u_2, u_3 and u_4

(3)

(b) u_{61}

(1)

(c) $\sum_{i=1}^{99} u_i$

(2)

(Total for Question 2 is 6 marks)