5 The first four terms of an arithmetic series, S, are

$$\log_a 2 + \log_a 4 + \log_a 8 + \log_a 16$$

(a) Write down an expression for the rth term of S.

(1)

(b) Find an expression for the common difference of S.

(2)

The sum of the first n terms of S is S_n

(c) Show that $S_n = \frac{1}{2}n(n + 1) \log_a 2$

(2)

The first four terms of a second arithmetic series, T, are

$$\log_a 6 + \log_a 12 + \log_a 24 + \log_a 48$$

The sum of the first n terms of T is T_n

(d) Find $T_n - S_n$ and simplify your answer.

(4)

Question 5 continued

Question 5 continued

Question 5 continued

(Total for Question 5 is 9 marks)