

8 The sum to infinity of a geometric series is 96

The first term of the series is less than 30

The second term of the series is 18

8 (a) Find the first term and common ratio of the series.

[5 marks]

8 (b) (i) Show that the n th term of the series, u_n , can be written as

$$u_n = \frac{3^n}{2^{2n-5}}$$

[4 marks]

8 (b) (ii) Hence show that

$$\log_3 u_n = n(1 - 2 \log_3 2) + 5 \log_3 2$$

[3 marks]