

**Advanced Higher Maths**  
**SQA 2025 Paper 2**  
**Question 13**



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An infinite geometric sequence of positive numbers has second term 100 and fourth term 16.

- (a) Determine:
- (i) the common ratio 2
  - (ii) the first term of this sequence. 1
- (b) Explain why the associated geometric series has a sum to infinity. 1
- (c) Determine this sum to infinity. 1

A new geometric sequence is formed by multiplying each term in the sequence above by the real number  $k$ , where  $k \neq 0$ .

- (d) State the effect that this will have on:
- (i) the common ratio 1
  - (ii) the sum to infinity of the associated series. 1
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Answers:

- (a) (i)  $\frac{2}{5}$   
(ii) 250
- (b)  $-1 < \frac{2}{5} < 1$
- (c)  $\frac{1250}{3}$
- (d) (i) The common ratio is unchanged.  
(ii) The sum to infinity is multiplied by  $k$ .