

4.3 Geometric Sequences & Series

Question Paper

Course	Edexcel IAL Maths: Pure 2
Section	4. Sequences & Series
Topic	4.3 Geometric Sequences & Series
Difficulty	Easy

Time allowed: 40

Score: /37

Percentage: /100

Identify which of the following are geometric sequences.

For those that are, write down the first term and the common ratio.

- (i) 3, 8, 13, 18, ...
- (ii) 5, 15, 45, 135, ...
- (iii) 5, -10, 20, -40, ...
- (iv) $\frac{1}{3}, \frac{1}{6}, \frac{1}{12}, \dots$

[4 marks]

Question 2

(a) Evaluate

$$\sum_{r=1}^{5} 3(2^r)$$

(b) Evaluate

$$\sum_{r=4}^{8} (-1)^r (2^r)$$

[2 marks]

Question 3

Write down a formula for the $n^{\rm th}$ term of each of the following geometric sequences

- (i) 3, 12, 48, 192, ...
- (ii) First term: a = 5

Common ratio: r = -2

(iii) $a = 16, r = \frac{1}{2}$

[3 marks]

Question 4

Find the 5th and 10th terms in each of the following geometric sequences

- (i) $u_n = 2(3)^n$
- (ii) $u_n = 10\ 000(1.02)^n$
- (iii) $u_n = 3^{-n}$

[3 marks]

(a)	The $3^{\rm rd}$ and $6^{\rm th}$ terms of a geometric sequence are 10 and 270 respectively,
	Find the first term and the common ratio.

[3 marks]

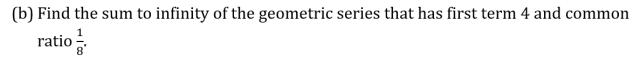
Question 5

(b) The 12^{th} term of a geometric sequence is 16 times greater than the 8^{th} term. Find the possible values of the common ratio.

[2 marks]

Question 6

(a) Find the sum of the first 12 terms of the geometric series that has first term 5 and common ratio $\frac{3}{2}$, giving your answer to the nearest whole number.



[2 marks]

Question 7

The first term of a geometric sequence is 2.

The 6th term of the sequence is 486.

The sum of the first *n* terms is 177 146.

(a) Find the common ratio.

[2 marks]

Question 7

(b) Show that $3^n = 177 147$.

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Question 7 (c) Hence find the value of n .	marks]
Question 8	
The first term of a geometric sequence is 6. The sum to infinity is 8.	
(a) Show that the common ratio is 0.25.	marks]
Question 8 (b) Briefly explain why the geometric sequence with first term 6 and common ration has a sum to infinity.	o 0.25 1 mark]

A geometric series is given by

$$k(k+1) + k(k+1)^2 + k(k+1)^3 + k(k+1)^4 + \cdots$$

where k is a constant such that |k + 1| < 1.

(a) Write down a formula for the nth term of the series, in terms of k.

[1 mark]

Question 9

(b) Show that the sum to infinity is -(k + 1).

[2 marks]

Question 9

(c) The sum to infinity is $-\frac{1}{4}$. Find the value of k.