

4.3 Geometric Sequences & Series

Question Paper

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

Time allowed: 50

Score: /45

Percentage: /100

Question 1

The first three terms of a geometric sequence are given by x^2 , $4x$, and $x + 14$ respectively, where $x > 0$.

(a) Show that $x^3 - 2x^2 = 0$.

[2 marks]

Question 1

(b) Find the value of the 15th term of the sequence.

[3 marks]

Question 1

(c) State, with a reason, whether 8192 is a term in the sequence.

[1 mark]

Question 2

A geometric sequence has first term 900 and a common ratio r where $r > 0$. The 18th term of the sequence is 18.

(a) Show that r satisfies the equation $17 \log r + \log 50 = 0$.

[3 marks]

Question 2

(b) Hence or otherwise find the value of r correct to 3 significant figures.

[1 mark]**Question 3**

A geometric series has first term 19 and common ratio $\frac{2}{3}$.

Given that the sum of the first k terms of the series is greater than 56

(i) Show that $k > \frac{\log\left(\frac{1}{57}\right)}{\log\left(\frac{2}{3}\right)}$

(ii) Hence find the smallest possible value of k .

[5 marks]

Question 4

The sum of the first two terms in a geometric series is 9.31.

The sum of the first four terms in the same series is 11.02.

The common ratio of the series is r .

(a) Show that $\frac{1-r^4}{1-r^2} = \frac{58}{49}$.

[2 marks]

Question 4

(b) Hence find the two possible values of r .

[2 marks]

Question 5

The first term of a geometric series is a , and its common ratio is 5. A different geometric series has first term b and common ratio 3. The sum of the first three terms of both series is the same.

Find the value of $\frac{a}{b}$, giving your answer as a fraction in simplest terms.

[4 marks]

Question 6

The first three terms in a geometric series are $(k - 3)$, k , $(2k + 8)$, where $k > 0$ is a constant.

(a) (i) Show that $k^2 + 2k - 24 = 0$.

(ii) Hence find the value of k .

[5 marks]**Question 6**

(b) Find the common ratio, r , of this series.

[1 mark]**Question 6**

(c) Find the sum of the first 12 terms in this series.

[2 marks]

Question 7

Given that the geometric series $-1 + 3x - 9x^2 + 27x^3 + \dots$ is convergent

(a) find the range of possible values of x

[3 marks]

Question 7

(b) find an expression for the sum to infinity, S_{∞} , in terms of x .

[1 mark]

Question 8

A convergent geometric series has first term 64, and the sum to infinity of the series is 384.

(a) Show that the common ratio, r , of the series is $\frac{5}{6}$.

[2 marks]

Question 8

(b) Find the difference between the ninth and tenth terms of the series, giving your answer correct to 3 significant figures.

[2 marks]

Question 8

(c) Calculate the sum of the first eight terms in the series, giving your answer correct to 3 significant figures.

[2 marks]

Question 8

(d) Given that the sum of the first k terms of the series is greater than 380, find the smallest possible value of k .

[4 marks]



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