4.3 Geometric Progressions

Question Paper

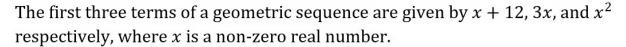
Course	CIE AS Maths
Section	4. Sequences & Series
Topic	4.3 Geometric Progressions
Difficulty	Hard

Time allowed: 60

Score: /42

Percentage: /100

Question 1



Find the value of the 102nd term in the sequence.

[5 marks]

Question 2

The sum of the first three terms in a geometric series is 8.75. The sum of the first six terms in the same series is 13.23.

Find the common ratio, r, of the series.

[4 marks]

Question 3

A geometric series has first term a and common ratio $\sqrt{5}$.

Show that the sum of the first ten terms of the series is equal to $ka(\sqrt{5} + 1)$, where k is a positive integer to be determined.

[4 marks]

Question 4a

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

(a) Find the value of k.

[5 marks]

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

[3 marks]

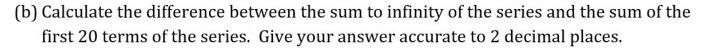
Question 5a

The second and fifth terms of a geometric series are 13.44 and 5.67 respectively. The series has first term a and common ratio r.

(a) By first determining the values of a and r, calculate the sum to infinity of the series.

[6 marks]

Question 5b



[2 marks]

Question 6a

A geometric progression has first term 9, and the sum of the first three terms of the progression is 19. The common ratio of the progression is r.

(a) Show that $9r^2 + 9r - 10 = 0$.

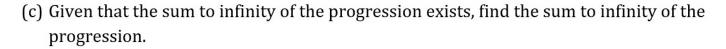
[3 marks]

Question 6b

(b) Find the two possible values of r.

[2 marks]

Question 6c



[3 marks]

Question 7a

The *k*th term of a geometric progression is given by $u_k = 2401 \left(\frac{2}{7}\right)^k$.

Calculate, giving your answers as exact values

(a) The sum to infinity of the progression starting with the seventh term.

[3 marks]

Question 7b

(b) The sum to infinity of the progression whose kth term is given by $v_k = u_{k+4}$, where u_k is defined as above.

[2 marks]

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