

4.4 Sequences & Series

Question Paper

Course	Edexcel IAL Maths: Pure 2
Section	4. Sequences & Series
Topic	4.4 Sequences & Series
Difficulty	Hard

Time allowed: 30

Score: /28

Percentage: /100

Question 1

Given that $\sum_{r=1}^k (31 - 6r) = -943$,

(i) Show that $(3k + 41)(k - 23) = 0$

(ii) Hence, find the value of k .

[4 marks]**Question 2**

Given that $\sum_{r=1}^k 7 \times 3^r = 620004$,

(a) Show that $k = \frac{\log 59049}{\log 3}$

[4 marks]

Question 2

(b) For this value of k , calculate $\sum_{r=0}^{k+3} 7 \times 3^r$.

[3 marks]**Question 3**

Given that $\sum_{n=1}^9 (a + (n-1)d) = -279$ and $\sum_{n=1}^{13} (a + (n-1)d) = -585$, find the values of a and d .

[4 marks]**Question 4**

A convergent geometric series is given by $1 - 4x + 16x^2 - 64x^3 + \dots$

(a) Write down the range of possible values of x .

[3 marks]

Question 4

Given that $\sum_{n=1}^{\infty} (-4x)^{n-1} = 24$

(b) Calculate the value of x .

[3 marks]

Question 5

The terms of a sequence are defined, for all $k \geq 1$, by $u_k = (-1)^k \times k^2$.

(a) State, with a reason, whether this sequence is increasing, decreasing, or neither.

[1 mark]

Question 5

It can be shown that, for all $n \geq 1$,

$$\sum_{r=1}^n (2r)^2 = \frac{2n(n+1)(2n+1)}{3} \quad \text{and} \quad \sum_{r=1}^n (2r-1)^2 = \frac{n(2n+1)(2n-1)}{3}$$

Using those formulas,

(b) Show that $\sum_{r=1}^{100} u_r = \sum_{r=1}^{100} r$.

[6 marks]