4.2 Arithmetic Sequences & Series

Question Paper

Course	Edexcel IAL Maths: Pure 2
Section	4. Sequences & Series
Topic	4.2 Arithmetic Sequences & Series
Difficulty	Hard

Time allowed: **50**

Score: **/43**

Percentage: **/100**

Question 1

The first two terms in an arithmetic sequence are $(p + 15)$ and 3. The fourth term is $(3p - 16)$.

Find the value of p.

[3 marks]

Question 2

The first three terms in an arithmetic sequence are $(q - 2),\ q^2,\ (4q + 5), \ldots$

Find the possible values of q.

[3 marks]

Question 3

An arithmetic sequence has first term r^2 and common difference $2r$, where $r > 0$. The fourth term in the sequence is 4.

Find the value of r, giving your answer as an exact value.

[4 marks]

Question 4

The third term of an arithmetic series is 32. The eleventh term is 0. The sum of the first n terms is -44.

Find the value of n.

[5 marks]

Question 5

The sum of the first twelve terms in an arithmetic series is 654. The sum of the first twenty terms in the same series is 530. Find the 21^{st} term.

[4 marks]

Question 6

(a) Prove that the sum of the first n odd numbers is a square number for any value of $n \geq 1$.

[3 marks]

Question 6

(b) An arithmetic series is defined by

$$7k + 14k + 21k + \ ... + 1008$$

where k is an integer.

(i) In terms of k, find an expression for the number of terms in this series.

(ii) In addition to being an integer, what other two conditions must k satisfy for this to be a valid arithmetic series?

(iii) Show that the sum of this series is $504 + \frac{72576}{k}$.

[5 marks]

Question 7

The seventh term of an arithmetic series is $3k$, where k is a constant, and the sum of the first nine terms of the series is $4k - 3$.

(a) In terms of k, find expressions for the first term and common difference of the series.

[5 marks]

Question 7

(b) Given that the nineteenth term of the sequence is 57, find the sum of the first 25 terms of the series.

[4 marks]

Question 8

An arithmetic series is defined by

$$S_n = (k + 13) + (2k + 9) + (3k + 5) + \ldots + u_n + \ldots$$

(a) Find an expression for n in terms of u_n and k.

[2 marks]

Question 8

For a particular value of n, $u_n = -16$ and $S_n = -11$.

(b) Find the value of k.

[5 marks]