4.2 Arithmetic Sequences & Series

Question Paper

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

Time allowed: **50**

Score: **/42**

Percentage: **/100**

Question 1

The first three terms in an arithmetic sequence are $(p-9),\ -7,\ (9-3p), \ldots$

Find the value of p.

[3 marks]

Question 2

The first three terms in an arithmetic sequence are $-1,\ (q+1),\ q^2, \ldots$

Find the possible values of q.

[3 marks]

Question 3

An arithmetic sequence has first term r^2 and common difference $3r$, where $r > 0$. The fifth term of the sequence is 85.

Find:

(i) the value of r

(ii) the ninth term in the sequence.

[4 marks]

Question 4

The third term of an arithmetic series is 2. The twelfth term is 65. The sum of the first n terms is 390.

(a) Show that $7n^2 - 31n - 780 = 0$.

[4 marks]

Question 4

(b) Hence find the value of n.

[1 mark]

Question 5

The sum of the first ten terms in an arithmetic series is 40. The sum of the first twenty terms in the same series is 280. Find the first term, a, and the common difference, d, of the series.

[3 marks]

Question 6

The sum of the first n terms of an arithmetic series is

$$S_n = (k + 7) + (2k + 18) + (3k + 29) + \ldots + 36$$

(a) Show that $n = \frac{40}{k + 11}$.

[2 marks]

Question 6

(b) Hence show that the sum of the first n terms is $\frac{20k + 860}{k + 11}$.

[3 marks]

Question 6

(c) Given that $S_n = 180$, find the value of k.

[1 mark]

Question 7

The fifth term of an arithmetic series is k, where k is a constant, and the sum of the first eight terms of the series is $2k$.

(a) Show that the first term, a, of the series is $-5k$.

[3 marks]

Question 7

(b) Find an expression for the common difference, d, of the series in terms of k.

[2 marks]

Question 7

Given that the ninth term of the sequence is 14, calculate:

(c) the value of k

[2 marks]

Question 7

(d) The sum of the first 30 terms of the series.

[2 marks]

Question 8

(a) Calculate the sum of all the odd numbers between 0 and 150,

$$1 + 3 + 5 + \ldots + 149$$

[3 marks]

Question 8

(b) An arithmetic series is defined by

$$k + 2k + 3k + \ ... + 360$$

where k is an integer and a positive factor of 360.

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

(ii) Show that the sum of this series is $180 + \frac{64800}{k}$.

[4 marks]

Question 8

(c) In terms of q, find the 100th term of the arithmetic sequence defined by

$$(3q - 7),\ (5q - 4),\ (7q - 1), ...$$

Give your answer in simplest form.

[2 marks]