1 The first five terms of an arithmetic sequence are

1 4 7 10 13

Write down an expression, in terms of n, for the nth term of this sequence.

.....

(Total for Question 1 is 2 marks)

2 Here are the first four terms of an arithmetic sequence.

6 10 14 18

(a) Write an expression, in terms of n, for the nth term of this sequence.

.....

(2)

The nth term of a different arithmetic sequence is $3n + 5$

(b) Is 108 a term of this sequence?
Show how you get your answer.

(2)

(Total for Question 2 is 4 marks)

3 Here are the first 5 terms of an arithmetic sequence.

-3 1 5 9 13

(a) ind an expression, in terms of n, for the nth term of this sequence.

.....

(2)

The nth term of a different arithmetic sequence is $2n - 3$

(b) Is 101 a term in this sequence?
Show how you get your answer.

.....

(2)

(Total for Question 3 is 4 marks)

4 Here are the first five terms of an arithmetic sequence.

7 13 19 25 31

(a) Find an expression, in terms of n, for the nth term of this sequence.

.....

(2)

The nth term of a different sequence is $8 - 6n$

(b) Is -58 a term of this sequence?
You must show how you get your answer.

(2)

(Total for Question 4 is 4 marks)

5 Here are the first 4 terms of an arithmetic sequence.

85 79 73 67

Find an expression, in terms of n, for the nth term of the sequence.

.....

(Total for Question 5 is 2 marks)

6 Here are the first five terms of a number sequence S.

10 16 22 28 34

(a) Find an expression, in terms of n, for the nth term of this sequence.

(2)

The nth term of a sequence T is given by $n^2 - 3$

There are numbers that are terms in both the sequence S and the sequence T.

(b) Find one of these numbers.

(2)

(Total for Question 6 is 4 marks)

7 Here are the first five terms of an arithmetic sequence.

1 5 9 13 17

(a) Find an expression, in terms of n, for the nth term of this sequence.

.....

(2)

The nth term of another arithmetic sequence is $3n + 5$

(b) Find an expression, in terms of m, for the $(2m)$th term of this sequence.

.....

(1)

(Total for Question 7 is 3 marks)

8 The nth term of a sequence is $2n^2 - 1$

The nth term of a different sequence is $40 - n^2$

Show that there is only one number that is in both of these sequences.

(Total for Question 8 is 3 marks)

9 The first four terms of a Fibonacci sequence are

$$a \qquad 2a \qquad 3a \qquad 5a$$

The sum of the first five terms of this sequence is 228

Work out the value of a.

.....

(Total for Question 9 is 3 marks)

10 Here are the first four terms of an arithmetic sequence.

6 10 14 18

(a) Find an expression, in terms of n, for the nth term of this sequence.

.....

(2)

(b) Write down an expression, in terms of n, for the $(n + 1)$th term of this sequence.

.....

(1)

(Total for Question 10 is 3 marks)

11 In a warehouse there are two types of shelves, type **R** and type **S**.

These two types of shelves are arranged into shelving units that form a sequence of patterns.

Here are the first three terms in the sequence.

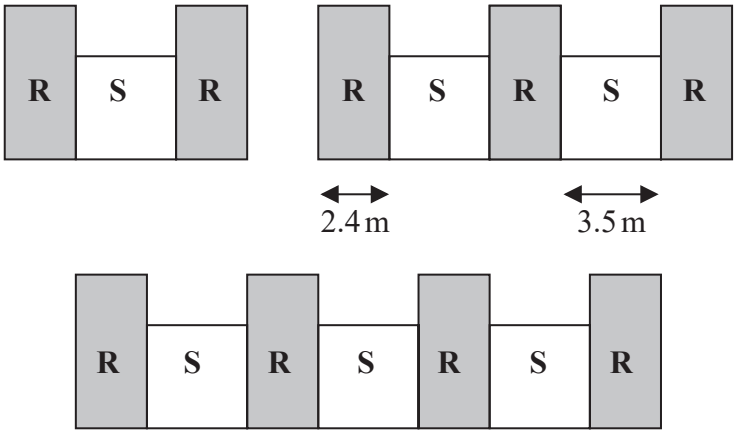

Diagram **NOT** accurately drawn

The width of each type **R** shelf is 2.4 m and the width of each type **S** shelf is 3.5 m

(a) Work out the total width of a shelving unit that has 6 type **R** shelves.

..... m

(2)

A shelving unit has n type **R** shelves.
The total width of this shelving unit is W metres.

(b) Find an expression for W in terms of n
Give your answer in its simplest form.

$W =$ .....

(2)

(Total for Question 11 is 4 marks)

12 Here are the first six terms of a Fibonacci sequence.

1 1 2 3 5 8

The rule to continue a Fibonacci sequence is,

the next term in the sequence is the sum of the two previous terms.

(a) Find the 9th term of this sequence.

.....

(1)

The first three terms of a different Fibonacci sequence are

a b $a + b$

(b) Show that the 6th term of this sequence is $3a + 5b$

(2)

Given that the 3rd term is 7 and the 6th term is 29,

(c) find the value of a and the value of b.

.....

(3)

(Total for Question 12 is 6 marks)

13 Here are the first four terms of a sequence of fractions.

$$\frac{1}{1} \quad \frac{2}{3} \quad \frac{3}{5} \quad \frac{4}{7}$$

The numerators of the fractions form the sequence of whole numbers 1 2 3 4 …
The denominators of the fractions form the sequence of odd numbers 1 3 5 7 …

(a) Write down an expression, in terms of n, for the nth term of this sequence of fractions.

(2)

(b) Using algebra, prove that when the square of any odd number is divided by 4 the remainder is 1

(3)

(Total for Question 13 is 5 marks)

14 $(2x + 23)$, $(8x + 2)$ and $(20x - 52)$ are three consecutive terms of an arithmetic sequence.

Prove that the common difference of the sequence is 12

(Total for Question 14 is 4 marks)