

1 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 n th term of this sequence.

.....
(2)

The n th 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 1 is 3 marks)

- 2 Here are the first 4 terms of an arithmetic sequence.

85 79 73 67

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

.....
(Total for Question 2 is 2 marks)

- 3 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 n th term of this sequence.

(2)

The n th 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 3 is 4 marks)

- 4 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.

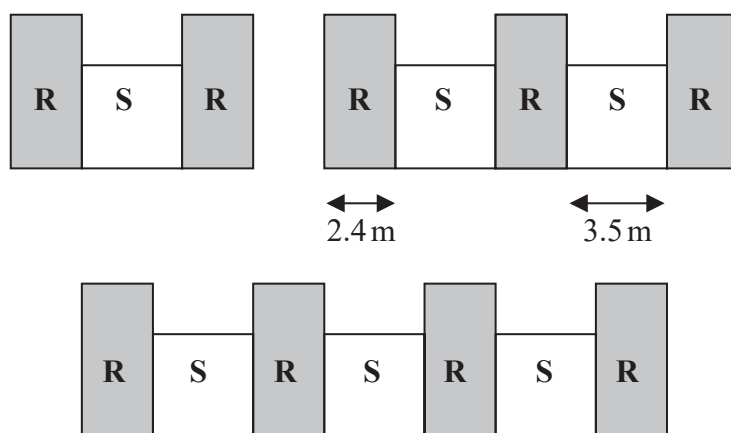


Diagram **NOT**
accurately drawn

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 4 is 4 marks)

5 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 n th 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 5 is 5 marks)

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

-3 1 5 9 13

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

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

.....
(2)

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

.....
(2)

(Total for Question 6 is 4 marks)

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

6 10 14 18

(a) Find an expression, in terms of n , for the n th 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 7 is 3 marks)

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

Prove that the common difference of the sequence is 12

(Total for Question 8 is 4 marks)