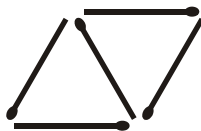


nth term

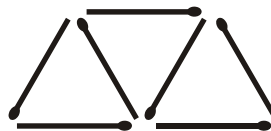
1. Catalina is making triangle patterns with matchsticks.



Pattern 1



Pattern 2



Pattern 3

(a) Draw Pattern 4 and Pattern 5 below.

(2)

(b) Complete the table for the number of matchsticks in each pattern.

Pattern number	1	2	3	4	5
Number of matchsticks	3	5			

(2)

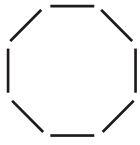
(c) Explain how to find the number of matchsticks in Pattern 6 without drawing it.

.....

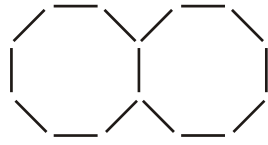
(1)

(Total 5 marks)

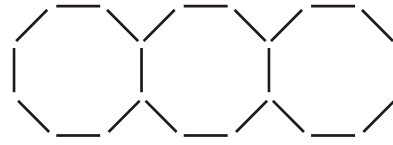
2. A sequence of patterns is made using octagons.
Each octagon is made of sticks.



Pattern 1
8 sticks



Pattern 2
15 sticks



Pattern 3
22 sticks

- (a) (i) How many sticks are needed for Pattern 5?

.....

Answer

(1)

- (ii) Explain how you worked out your answer.

.....

.....

(1)

- (b) Write down an expression for the number of sticks in Pattern n .

.....

Answer

(2)

- (c) Which pattern uses 358 sticks?

.....

.....

Answer

(2)

(Total 6 marks)

3. (a) The n th term of a sequence is $4n + 1$

(i) Write down the first three terms of the sequence.

.....
.....
.....

Answer,,

(2)

(ii) Is 122 a term in this sequence?
Explain your answer.

.....
.....

(1)

(b) Tom builds fencing from pieces of wood as shown below.

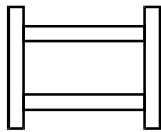


Diagram 1
4 pieces of wood

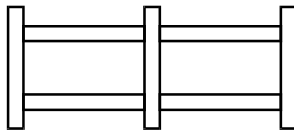


Diagram 2
7 pieces of wood

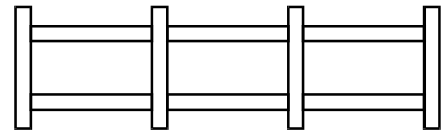


Diagram 3
10 pieces of wood

How many of pieces of wood will be in Diagram n ?

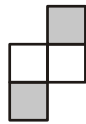
.....
.....
.....
.....
.....

Answer

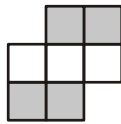
(2)

(Total 5 marks)

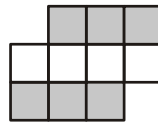
4. Patterns are made from shaded and unshaded squares.



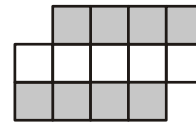
1st pattern



2nd pattern



3rd pattern



4th pattern

(a) How many shaded squares are there in the n th pattern?

.....

Answer

(1)

(b) How many unshaded squares are there in the n th pattern?

.....

.....

Answer

(1)

(Total 2 marks)

5. The n th term of a sequence is $3n - 1$

(a) Write down the first and second terms of the sequence.

.....

.....

Answer First term

Second term

(2)

(b) Which term of the sequence is equal to 32?

.....

.....

Answer.....

(1)

(c) Explain why 85 is not a term in this sequence.

.....

.....

.....

(2)

(Total 5 marks)

6. A sequence of numbers is shown.

5 9 13 17 21

(a) Find an expression for the n th term of the sequence.

.....
.....

Answer

(2)

(b) Explain why 83 will not be a term in this sequence.

.....
.....

(2)

(Total 4 marks)

7. A sequence of numbers is shown.

2 5 8 11 14

(a) Find an expression for the n th term of the sequence.

.....
.....

Answer

(2)

(b) Explain why 99 will not be a term in this sequence.

.....
.....
.....

(2)

(Total 4 marks)