

## Week 4

Sequences

Name: \_\_\_\_\_

Class: \_\_\_\_\_

Date: \_\_\_\_\_

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Time: **21 minutes**

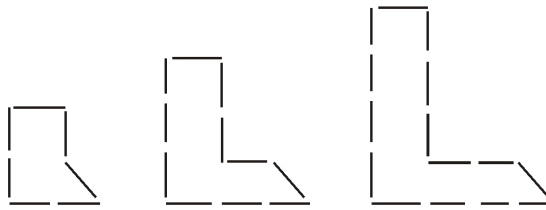
Marks: **20 marks**

Comments:

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1

Ann makes a pattern of L shapes with sticks.



Shape-number: **1**

Number of sticks: 7

**2**

11

**3**

15

Ann says :

***"I find the number of sticks for a shape by first multiplying the shape-number by 4, then adding 3".***

Work out the **number** of sticks for the shape that has shape-number **10**

1 mark

Ann uses **59 sticks** to make another L shape in this pattern.

What is its shape-number?

Show  
your  
method

2 marks

Here is Ann's rule again:

***"I find the number of sticks for a shape by first multiplying the shape-number by 4, then adding 3".***

Write a formula to work out the number of sticks for any **L** shape.

Use **S** for the number of **sticks** and **N** for the **shape-number**.

<b>S</b> =
------------

2 marks

**2**

The rule for this sequence of numbers is 'add 3 each time'.

**1   4   7   10   13   16   ...**

The sequence continues in the same way.

Mary says,

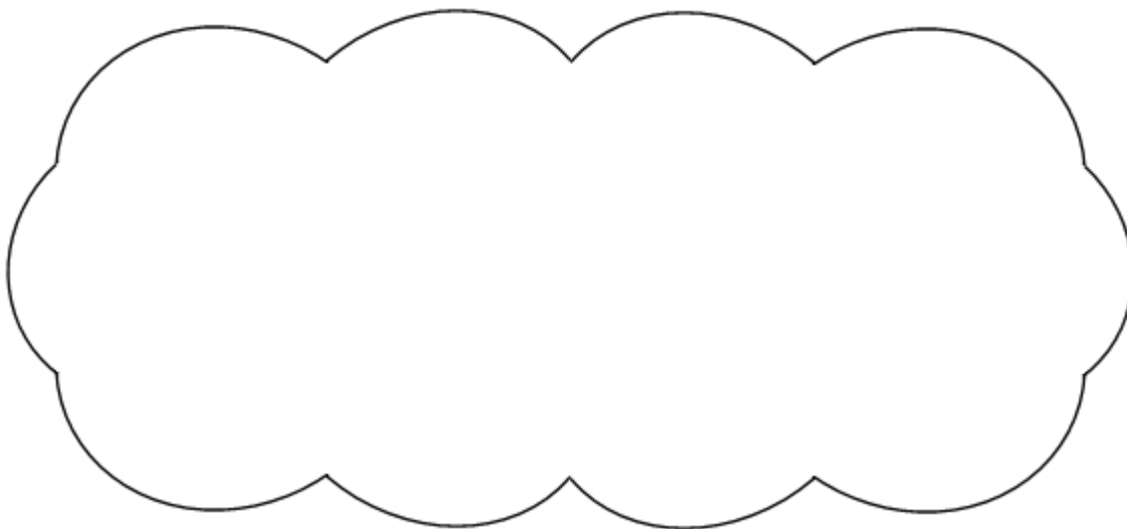
***'No matter how far you go there will never be a multiple of 3 in the sequence'.***

Is she correct?

Circle Yes or No.

**Yes / No**

Explain how you know.



1 mark

3

This sequence of numbers **goes up by 40** each time.

40   80   120   160   200   ...

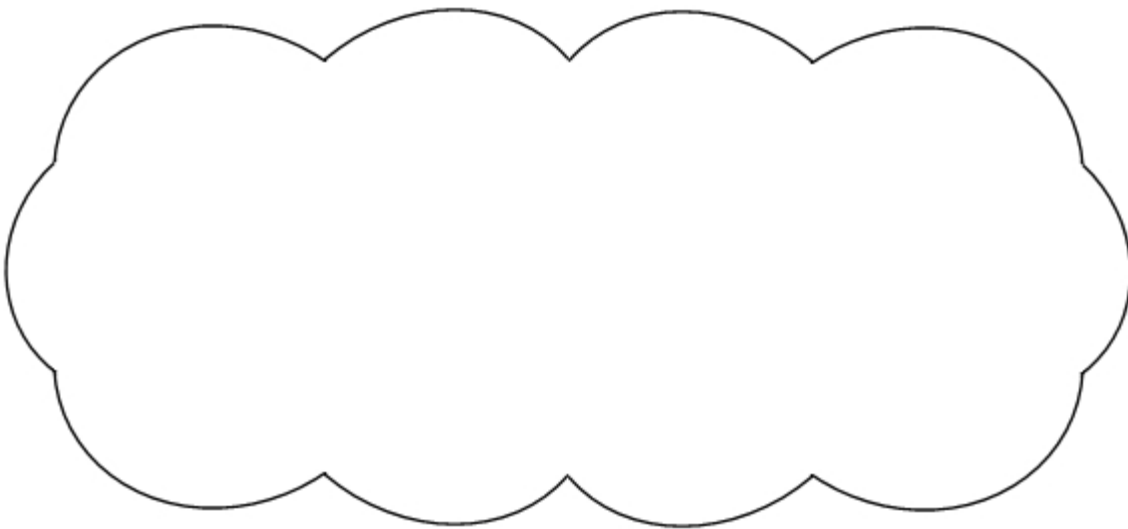
This sequence continues.

Will the number **2140** be in the sequence?

Circle **Yes** or **No**.

Yes / No

Explain how you know.

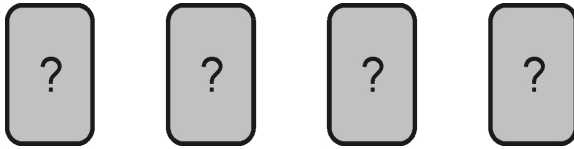


1 mark

4

Debbie has a pack of cards numbered from 1 to 20

She picks four different number cards.



Exactly three of the four numbers are multiples of 5

Exactly three of the four numbers are even numbers.

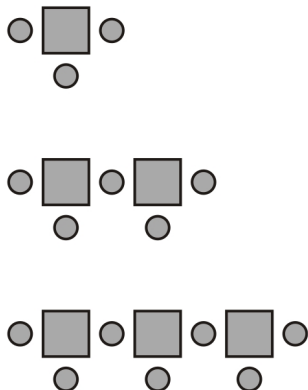
All four of the numbers add up to less than 40

Write what the numbers could be.

1 mark

5

Here is a sequence of patterns made from squares and circles.

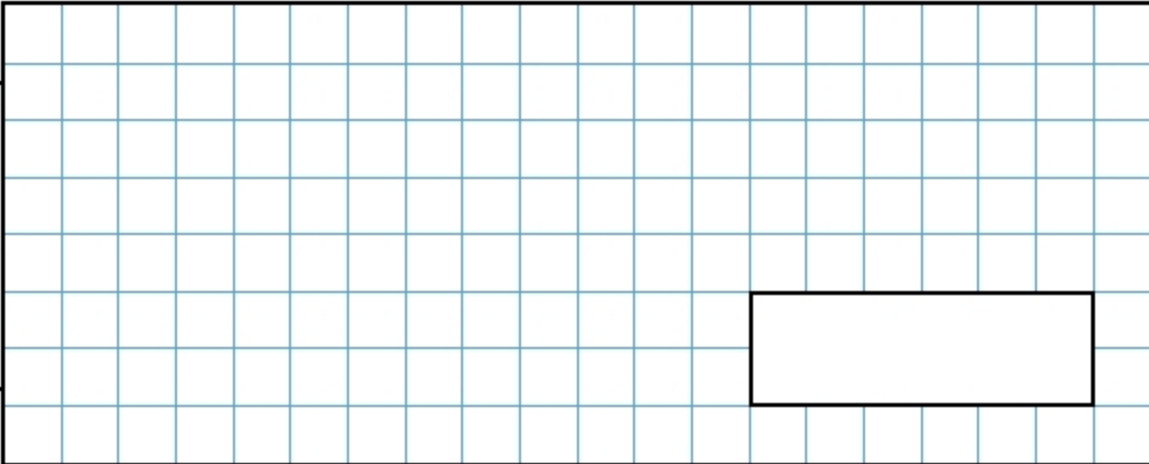


number of squares	number of circles
1	3
2	5
3	7

The sequence continues in the same way.

Calculate how many **squares** there will be in the pattern which has **25 circles**.

Show your method



2 marks

6

A sequence starts at **500** and **80** is **subtracted** each time.

500      420      340 ...

The sequence continues in the same way.

Write the **first two numbers** in the sequence which are **less than zero**.

2 marks

7

A sequence of numbers starts at 11 and follows the rule

**'double the last number and then subtract 3'**

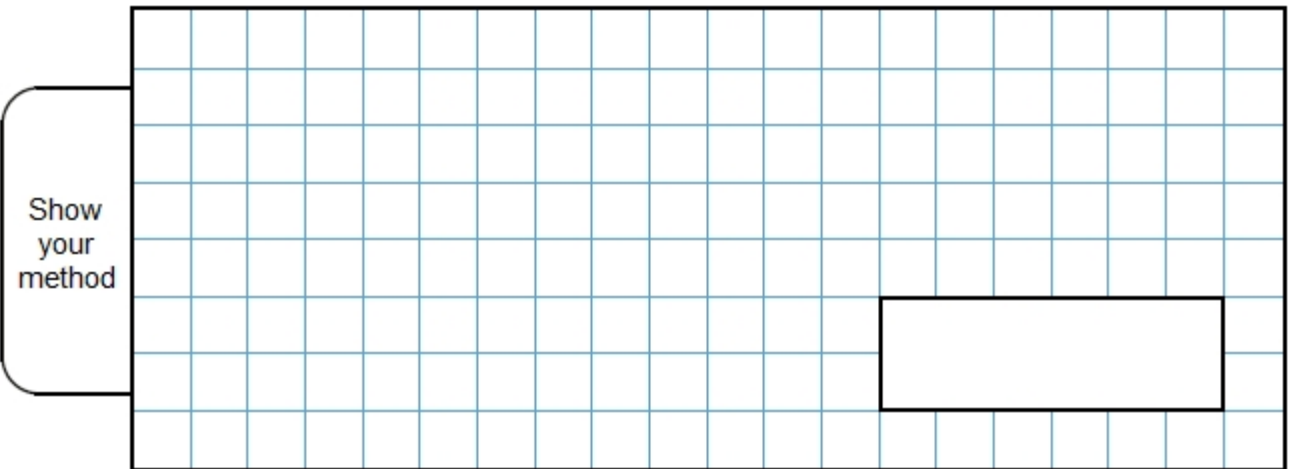
11    19    35    67    131 ...

The sequence continues.

The number 4099 is in the sequence.

Calculate the number which comes immediately **before 4099** in the sequence.

Show your method



2 marks

8

Jon makes a sequence of numbers.

His rule is to add the **same amount** each time.

Write in the missing numbers.

-1				19
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1 mark

9

The numbers in this sequence increase by 7 each time.

1      8      15      22      29      ....

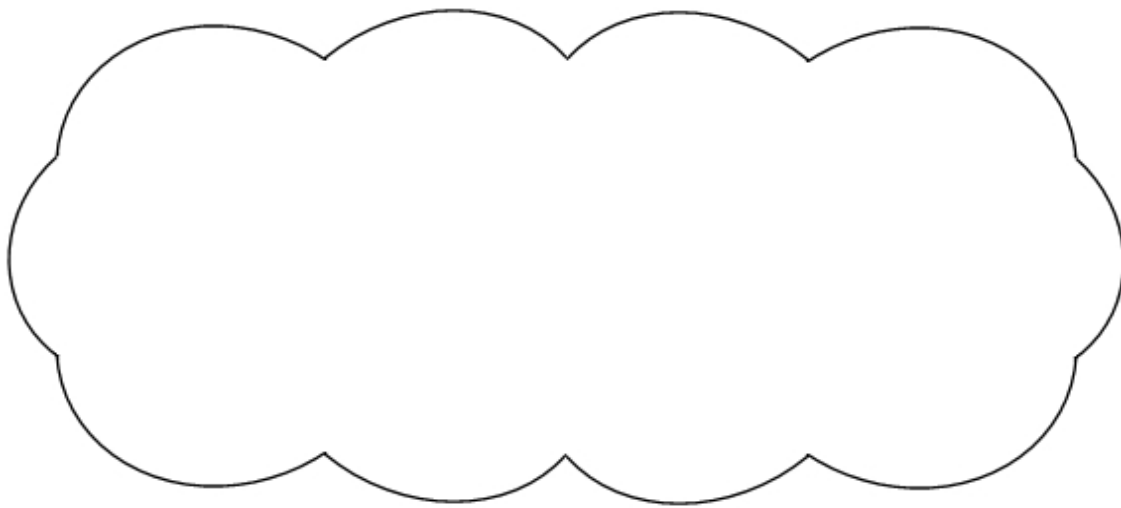
The sequence continues in the same way.

Will the number 777 be in the sequence?

Circle **Yes** or **No**.

Yes / No

Explain how you know.



1 mark

10

The rule to get each number in a sequence is

**subtract** the previous number from 100, then **divide** the answer by 2

Here is part of the sequence.

Write the two missing numbers.

40    30    35    32.5    33.75

2 marks



**11**

The numbers in this sequence increase by the same amount each time.

Write the missing numbers.

1

$1\frac{5}{8}$

$2\frac{1}{4}$

2 marks

## Mark schemes

1

- (a) Award **TWO** marks for the correct answer of 43, even if there are errors in the working.

If the answer is incorrect, award **ONE** mark for evidence of an appropriate calculation of multiplication by 4 and addition of 3, eg:

- $3 + (4 \times 10)$
- $4 \times 10 + 3$
- $10 + 10 + 10 + 10 + 3$

**OR by drawing OR other methods.**

Up to 2

- (b) 14

1

- (c) Award **TWO** marks for expressions such as:

- $S = 4N + 3$
- $S = 3 + 4N$
- $S = N + N + N + N + 3$

If the answer is incorrect, award **ONE** mark for evidence of multiplying N by 4 in the expression, eg:

- $4N$
- $4 \times N$
- $N.4$
- $N + N + N + N$

**OR** award **ONE** mark for evidence of adding 3 in the expression, eg:

- $N + 3$

***Do not accept***  $S = \times 4 + 3 = N$

Up to 2

[5]

**2**

Explanation which recognises that each number is one more than a multiple of 3, eg

- 'It starts at 1 and keeps adding 3 so it misses all the multiples of 3',
- 'Multiples of 3 are all 1 less than the numbers'.

*No mark is awarded for circling 'Yes' alone.*

**Do not** accept vague or arbitrary explanations such as

- 'They're too big';
- 'It doesn't go far enough';
- 'It is adding 3 all the time'.

*If 'No' is circled but a correct unambiguous explanation is given then award the mark.*

[1]

**3**

Explanation which recognises that the numbers in the sequence are multiples of 40 and that 2140 is not **OR** that only the even hundreds in the sequence have the numbers ending in 40, eg

- 'it doesn't divide by 40';
- '140 isn't in it so 2140 won't be';
- 'it will go 2000, 2040, 2080, 2120, 2160 ... so there's no 2140'.

**No mark** is awarded for circling 'No' alone.

*Do not accept vague or arbitrary explanations, eg*

- 'It's odd, so it won't be there';
- 'It's not part of the sequence'.

[1]

**4**

**2** **5** **10** **20**

OR

**4** **5** **10** **20**

**Accept the four numbers listed in any order.**

U1

[1]

**5**

Award **TWO** marks for the correct answer of 12

If the answer is incorrect, award **ONE** mark for evidence of appropriate working, eg  $25 - 1 = 24$   $24 \div 2 =$  wrong answer

*Calculation must be performed for the award of **ONE** mark.*

Up to 2

[2]

**6**

–60 in first box.

*Accept 'minus 60'*

**Do not** accept '60–'

–140 in second box

*Accept 'minus 140'*

**OR Do not** accept '140–'

**OR**

a number 80 less than the answer given in the first box provided both numbers are less than 0

*If the answers given are '60–' and '140–' respectively, award **ONE** mark only.*

Up to 2

[2]

**7**

Award **TWO** marks for the correct answer of 2051

If the answer is incorrect, award **ONE** mark for evidence of appropriate method, eg

$$(4099 + 3) \div 2$$

**OR**

continuation of sequence, eg

259, 515, 1027, wrong number

*Answer need not be obtained for the award of **ONE** mark.*

Up to 2

[2]

8

-1	4	9	14	19
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[1]

9

'No' is circled **AND** one of the following:

an explanation which recognises that 777 is not one more than a multiple of 7, eg:

- 'All the numbers are one more than a multiple of 7'
- 'There are no multiples of 7 in the sequence'
- '778 is in the sequence'
- '771 works but 777 doesn't'

**OR**

an explanation which recognises that 777 is a multiple of 7, eg:

- '777 is a multiple of 7'
- ' $777 \div 7 = 111$ '

**OR**

an explanation which relies solely on the start of the sequence, eg:

- 'The sequence started at 1'
- 'The sequence doesn't start at 0'.

*'No' must be indicated for the award of the mark, unless a **complete** and correct explanation is given, eg:*

- *'777 is a multiple of 7, and the numbers in the sequence aren't'.*

*No mark is awarded for circling 'No' alone.*

**Do not** accept vague or incomplete explanations, eg:

- *'It's adding 7 every time'*
- *'There are no 7s in the sequence'.*

U1

[1]

10

20

1

33.125

*Accept equivalent fractions or decimals*

1  
U1

[2]

11

(a)  $\frac{3}{8}$  written in the first box

1

*Accept equivalent fractions or an **exact** decimal equivalent, e.g.  
0.375*

(b)  $2\frac{7}{8}$  OR  $\frac{23}{8}$  written in the last box

1

*Accept equivalent fractions or an **exact** decimal equivalent, e.g.  
2.875*

[2]