Q1.

Jon makes a sequence of numbers.

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

Write in the missing numbers.

1 mark

Q2.

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

Write in the missing numbers

1 mark

Q3.

Here is part of a number sequence.

The numbers in the sequence increase by 25 each time.

50 75 100 125 …

Circle **all** of the numbers below that will appear in the sequence.

255 650 735 900 995

1 mark

Q4.

Dev says,

'When you halve any number that ends in 8 the answer always ends in 4'.

Is he correct?

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

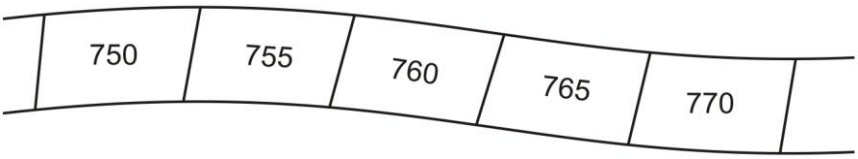
Explain how you know.

1 mark

Q5.

Here is part of a number sequence.

The numbers increase by the same amount each time.



The sequence continues.

Circle **all** of the numbers below that would appear in the sequence.

840 905 989 1000 2051

1 mark

Q6.

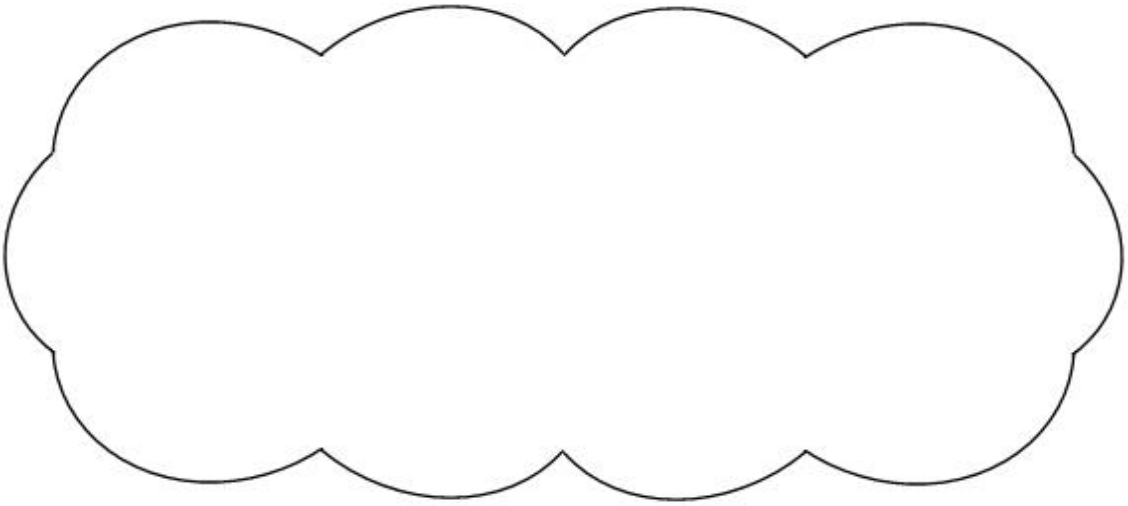
The numbers in this sequence increase by 7 each time.

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

Q7.

The numbers in this sequence increase by 75 each time.

Write in the two missing numbers.

☐ 725 800 875 950 ☐

2 marks

Q8.

Liam makes a sequence of numbers starting with 300

He subtracts 125 each time.

Write the next two numbers in Liam's sequence.

300 175 50 ☐ ☐

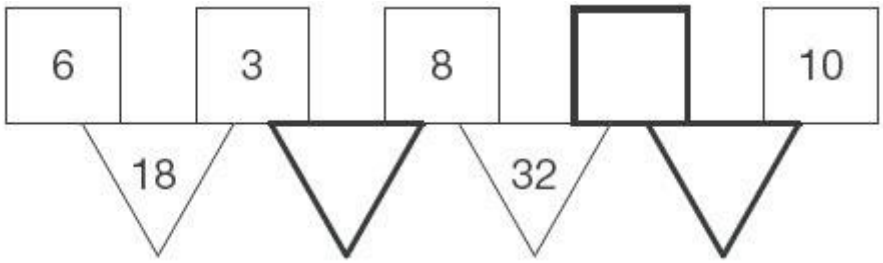
2 marks

Q9.

In this diagram the rule is

'to make the number in a triangle,
multiply the numbers in the two squares above it'.

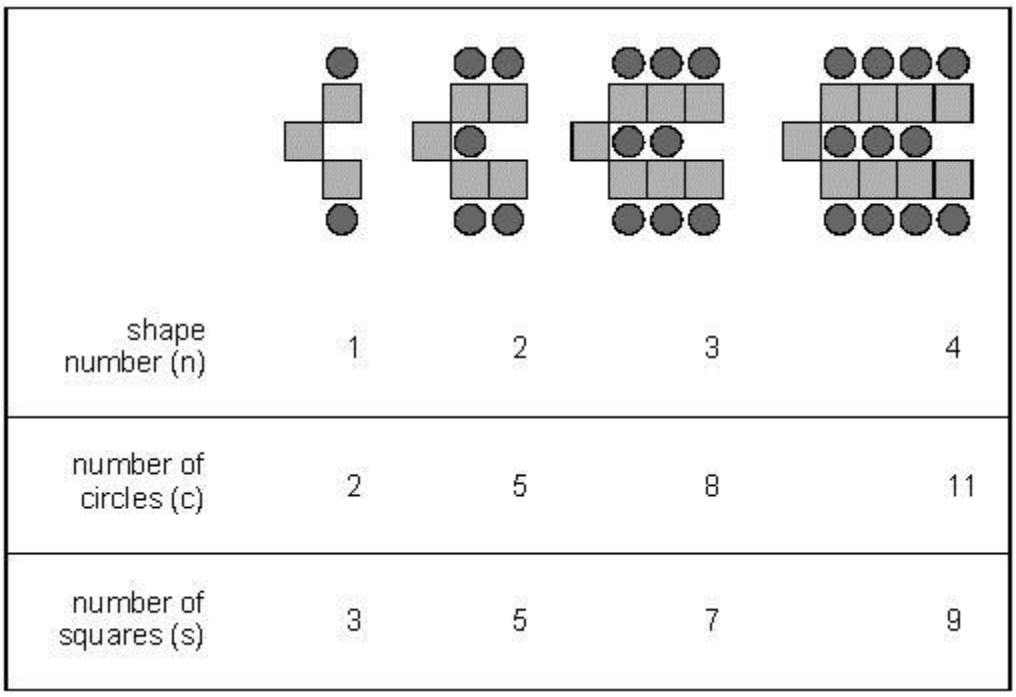
Write in the three missing numbers.



2 marks

Q10.

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



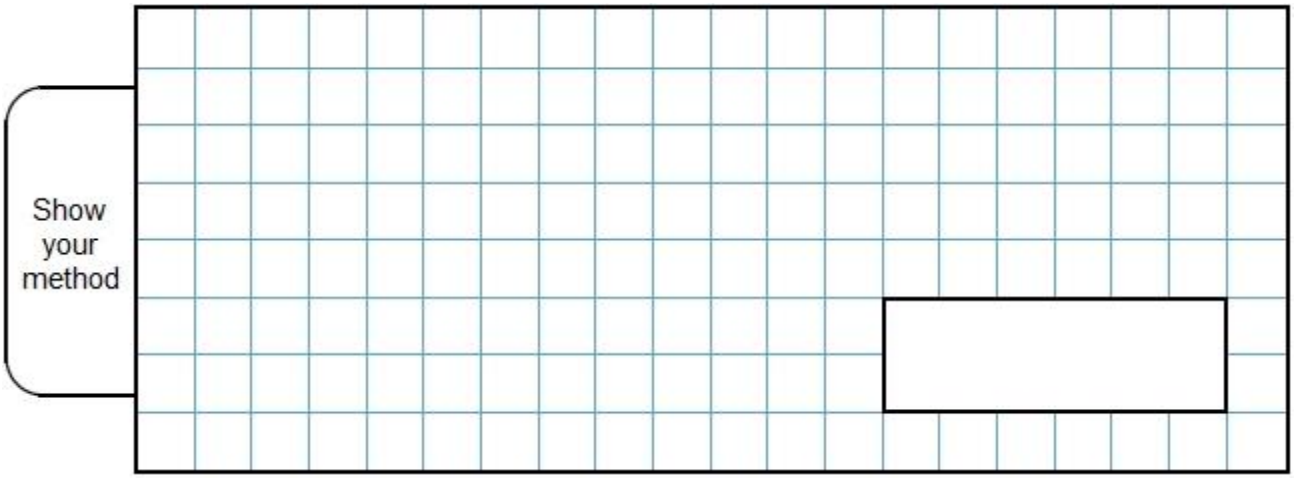
shape number (n)	1	2	3	4
number of circles (c)	2	5	8	11
number of squares (s)	3	5	7	9

The sequence continues in the same way.

The formula for the **number of circles (c)**
n **shape number (n)** is

$$c = 3n - 1$$

Use the formula to work out the **shape number** which has **104 circles**.



2 marks

Write the formula for the **number of squares (s)** in **shape number (n)**.

S = _____

1 mark

Q11.

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

Q12.

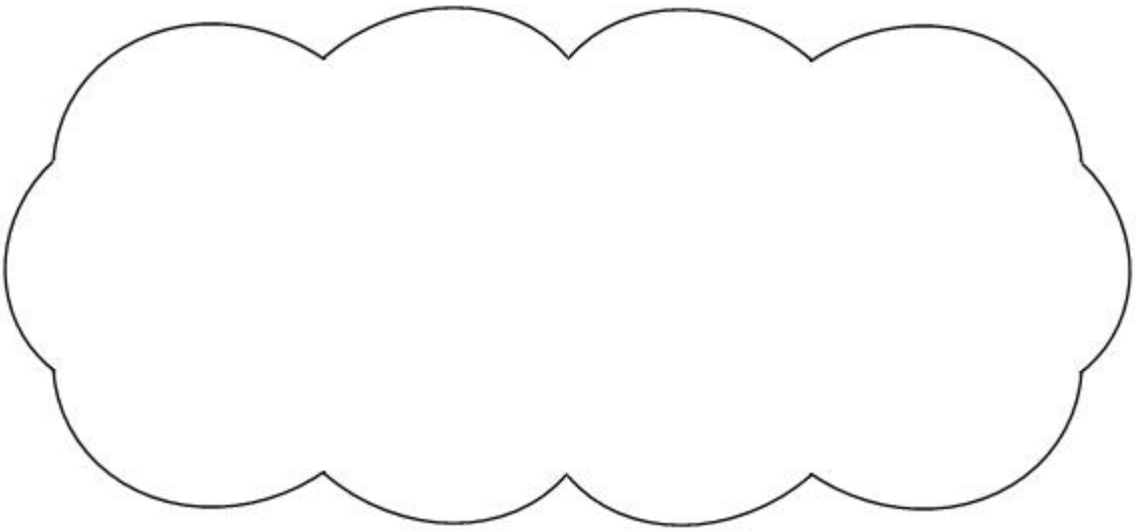
Nisha says,

'When you halve any even number,
the answer is always an odd number'.

Is she correct?

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

Explain how you know.



1 mark

Q13.

The numbers in this sequence increase by 3 each time.

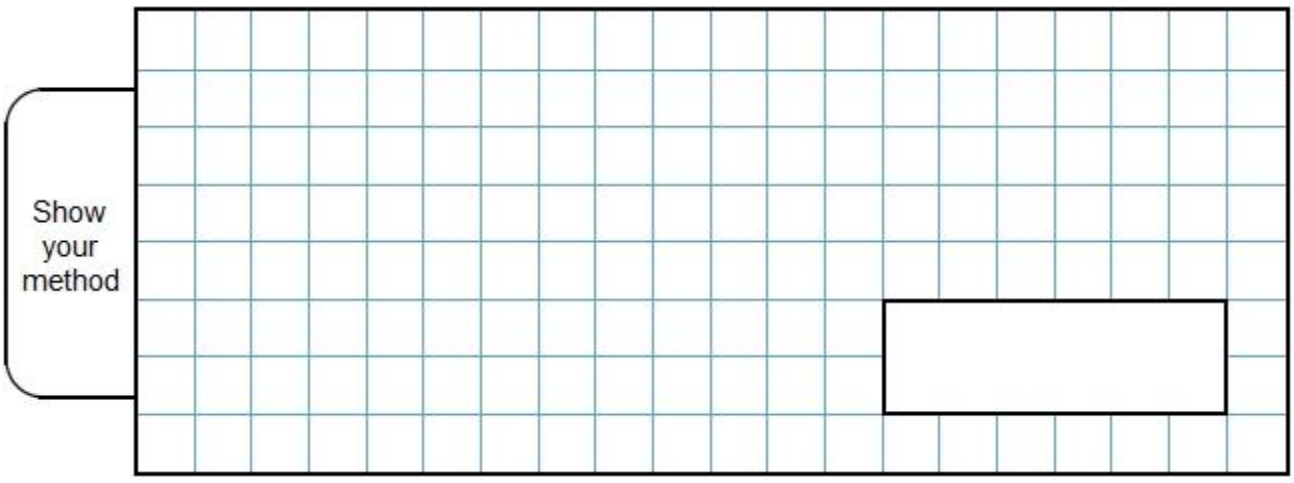
3 6 9 12 . . .

The numbers in this sequence increase by 5 each time.

5 10 15 20 . . .

Both sequences continue.

Write a number **greater than 100** which will be in **both** sequences.



2 marks

Mark schemes

Q1.

–1	4	9	14	19

[1]

Q2.

1	**5**	**9**	13

[1]

Q3.

Two numbers circled as shown:

255 (650) 735 (900) 995

Accept alternative unambiguous indications, eg numbers ticked, crossed or underlined.

[1]

Q4.

An explanation which gives a counter-example to illustrate that halving a number that ends in 8 does not always give a number ending in 4, eg:

- ’18 doesn’t work’
- ‘It could end in a 9’
- ‘Double 49 is 98’
- ’58 ÷ 2 = 29’
- ‘Half of 8 is 4 but half of 18 doesn’t end in 4’
- ’18, 28, 38, 48, 58, 68 – only half of them work’
- ‘It has to have an even number of 10s, like 28 or 88’
- ‘38’

No mark is awarded for circling ‘No’ alone.

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

- *‘Half of them don’t’*
- *‘Half of 28 is 14’*
- *‘Double 44 is 88’*

If ‘Yes’ is circled but a correct, unambiguous explanation is given, then award the mark.

U1

[1]

Q5.

Three numbers circled as shown:

Do not *award the mark if additional incorrect numbers are circled.*

Accept: alternative unambiguous indications, eg numbers ticked, crossed or underlined.

U1

[1]

Q6.

'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 ÷ 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]

Q7.

(a) 650 in first box.

1

(b) 1025 in second box.

1

[2]

Q8.

(a) –75 in the first box

Do not *accept 75–*

1

(b) –200 in the second box

Do not *accept 200–*

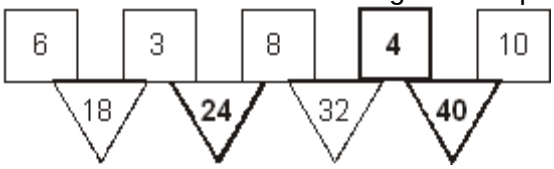
Accept a number 125 less than the answer to (a), provided the answer to 18a is negative.

1

[2]

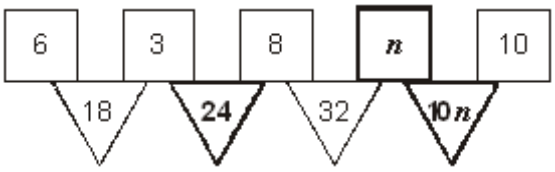
Q9.

Award **TWO** marks for the diagram completed as shown:



If the answer is incorrect, award **ONE** mark for two numbers correct

OR



where *n* is any number.

Up to 2

[2]

Q10.

Award **TWO** marks for the correct answer of 35

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

$104 = 3n - 1$
$105 = 3n$
$n = 105 \div 3$

Answer need not be obtained for award of the mark.

Up to 2

(b) $2n + 1$

Accept equivalent expressions eg n + n + 1

Accept the answer written in words, eg 'twice the shape number add one'.

1

[3]

Q11.

20

1

33.125

Accept equivalent fractions or decimals

1
U1

[2]

Q12.

An explanation which recognises that half of an even number is sometimes an even number, eg:

- ‘Every alternate even number gives an even number when halved’
- ‘Two even numbers make an even number’
- ‘Half of a multiple of 4 will always be even’
- ‘Sometimes you get an even number’

OR

a counter-example demonstrating that half of an even number can be an even number, eg:

- ‘Half of 8 is 4’
- ‘4 ÷ 2 = 2’
- ‘Double 10 is 20’
- ‘Half 12 is 6 but half 6 is 3’.

No mark is awarded for circling ‘No’ alone.

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

- *‘It doesn’t always work’*
- *‘It’s always even’*
- *‘Half of 6 is 3’*
- *‘Two odds make an even’.*

If ‘Yes’ is circled but a correct unambiguous explanation is given, then award the mark.

U1

[1]

Q13.

Award **TWO** marks for a multiple of 15 which is greater than 100, eg

105 **OR** 120 **OR** 135 **OR** 150 **OR** 300

Accept more than one answer if all are correct.

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

*Accept for **ONE** mark 30, 45, 60, 75 **OR** 90*

- 90 93 96 99 102 105 108 …
  90 95 100 105 110 115 …

  ← *Not spotting matching number (105)*

- 90 93 96 98 101 104 107 (110) …
  90 95 100 105 (110) 115 …

  ← *One step size incorrect (96 to 98)*

- 15 30 45 60 75 80 95 110 (125)

  ← *One step size incorrect (75 to 80)*

- 3 × 5 × 20
  OR
  15 × 10

  ← *Multiple greater than 100 but not calculated*

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

Up to 2

[2]