Q1.

Fill in the three missing whole numbers in this calculation.

Each number is less than 10

$\boxed{} \times \boxed{} \times \boxed{} = 105$

1 mark

Q2.

Emma thinks of two **prime** numbers.

She adds the two numbers together.

Her answer is 36

Write **all** the possible pairs of prime numbers Emma could be thinking of.

_____

2 marks

Q3.

36 and 64 are both square numbers

They have a sum of 100

Find two **square** numbers that have a sum of **130**

$\boxed{}$ and $\boxed{}$

1 mark

Q4.

364 is a multiple of 7 but not a multiple of 3

384 is a multiple of 3 but not a multiple of 7

Find a number between 364 and 384 that is **both** a multiple of 7 **and** a multiple of 3

Show your method

2 marks

Q5.

Here are some number cards.

| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |

Joe picks two **even** numbers.
Dev picks two **odd** numbers.

Joe gives one of his cards to Dev.
Dev gives one of his cards to Joe.

Joe says,

'Now my cards are both square numbers'.

Dev says,

'Now my cards are both multiples of 5'.

What numbers did they each start with?

Joe started with ☐ and ☐

Dev started with ☐ and ☐

2 marks
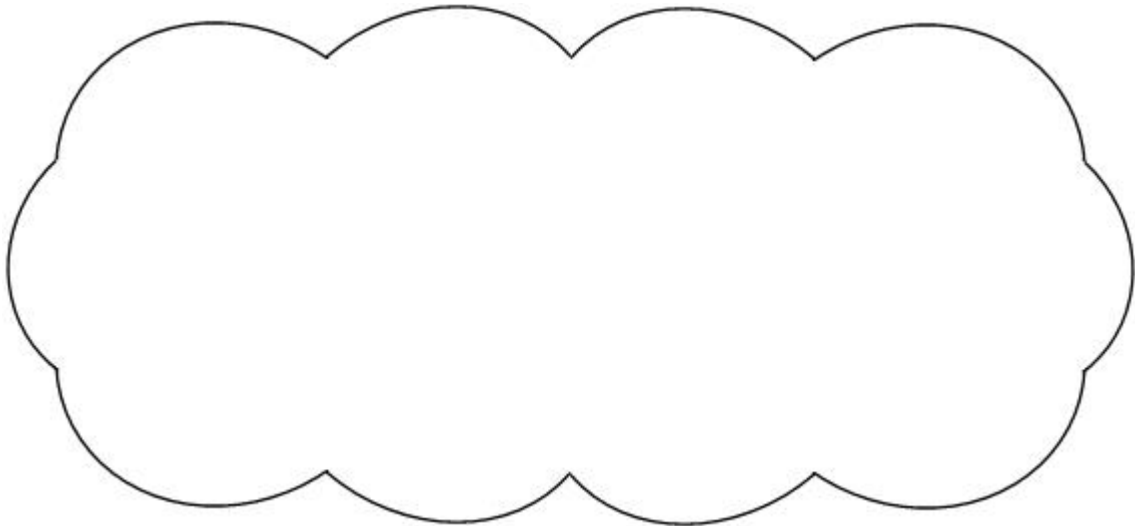
Q6.

Three whole numbers add up to 50

Seb says,

> *'All three numbers must be even numbers.'*

Is Seb correct?
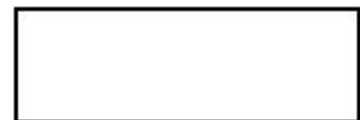Circle **Yes** or **No**.

Yes / No

Explain how you know.

1 mark

Q7.

Write **all** the numbers between 50 and 100 that are **factors of 180**

2 marks

Q8.

Work out the missing numbers below.

The first one is done for you.

The first ☐5☐ multiples of ☐4☐ **add to 60**

(because 4 + 8 + 12 + 16 + 20 = 60)

The first ☐3☐ multiples of ☐ ☐ **add to 60**

1 mark

Now use **different** numbers to complete the sentence below.

The first ☐ ☐ multiples of ☐ ☐ **add to 60**

1 mark

Q9.

Here is a number chart.

Every third number in the chart has a circle on it.

1	2	③	4	5
⑥	7	8	⑨	10
11	⑫	13	14	⑮
16	17	⑱	19	20
㉑	22			

The chart continues in the same way.

Here is another row in the chart.

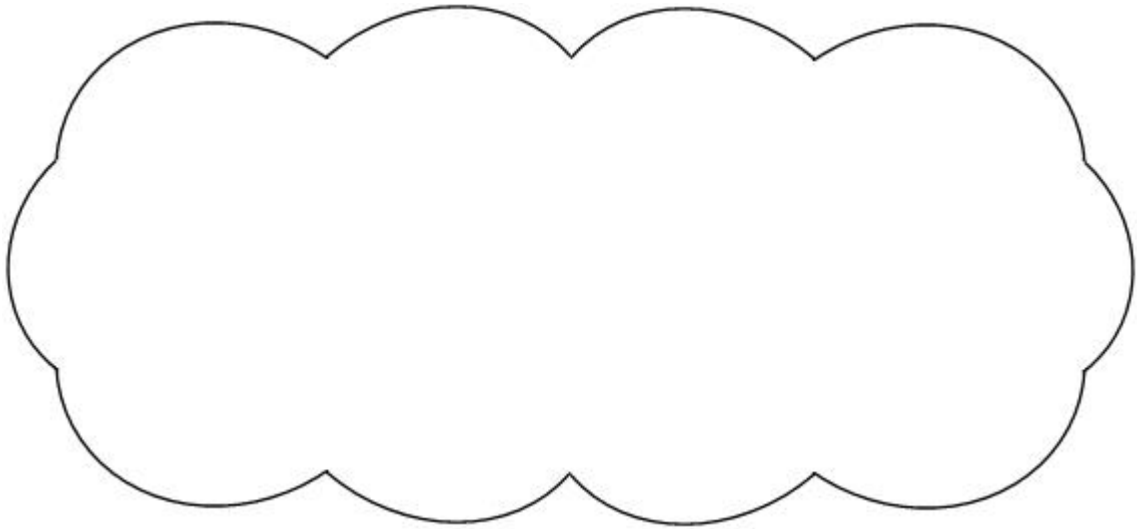Draw the missing circles.

71	72	73	74	75

1 mark

Will the number **1003** have a circle on it?
Circle **Yes** or **No**.

Yes / No

Explain how you know.

1 mark

Q10.

Circle the **two** prime numbers.

29   39   49   59   69

1 mark

Q11.

Find two **square numbers** that total 45
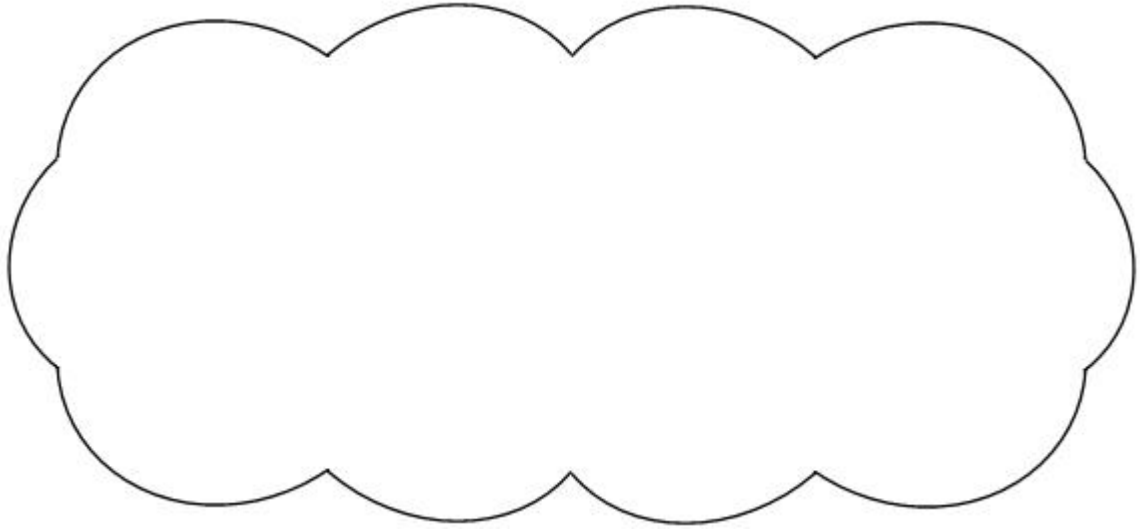
| | + | | = 45

1 mark

Q12.

Julie says,

> *'I added three odd numbers
> and my answer was 50'*
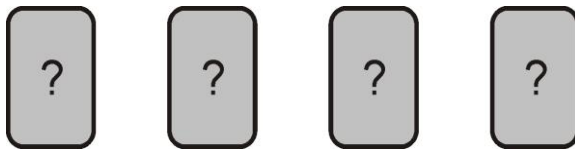
Explain why Julie cannot be correct.

1 mark

Q13.

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

Q14.

Write in the **two** missing digits.

| | 0 | × | | 0 | = | 3 | 0 | 0 | 0 |

1 mark

Q15.

Circle the number **closest** in value to **0.1**

0.01   0.05   0.11   0.2   0.9

Q16.

Write the **three prime numbers** which multiply to make **231**

☐ × ☐ × ☐ = 231

Q17.

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,

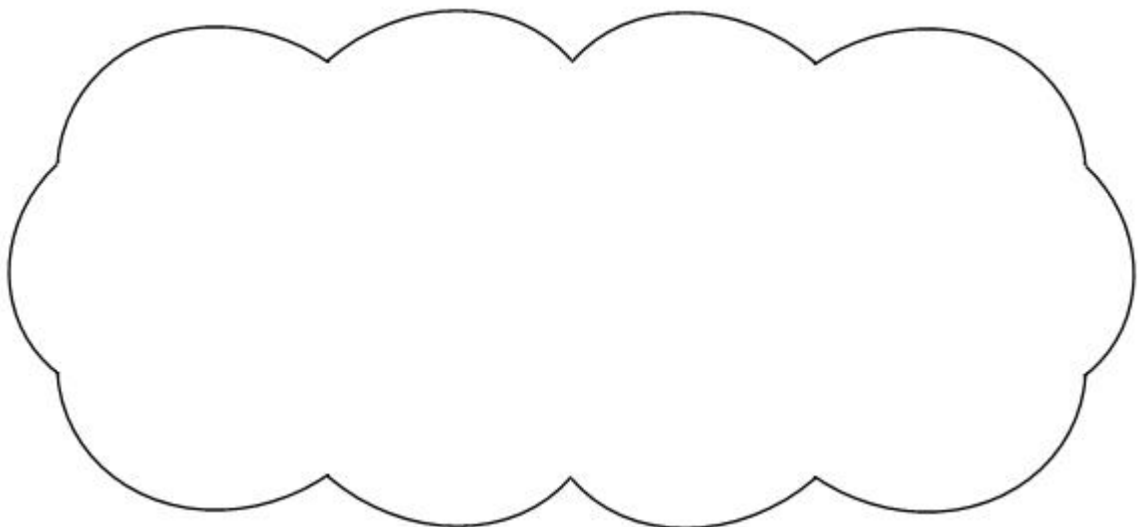*'No matter how far you go there will never be a multiple of 3 in the sequence'.*

Is she correct?
Circle Yes or No.   **Yes / No**

Explain how you know.

Q18.

This three-digit number has **2** and **7** as **factors**.

2 9 4

Write another **three-digit** number which has **2** and **7** as **factors**.

1 mark

Q19.

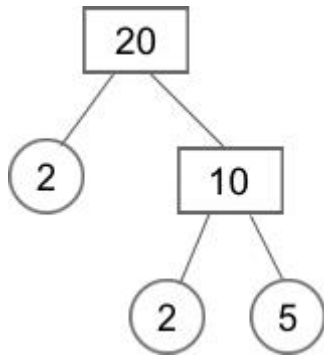Any number can be written as a product of its prime factors,
for example:

$$20 = 2 \times 2 \times 5$$

Write 90 as a product of its prime factors.

$$90 = \rule{3cm}{0.4pt}$$

1 mark

Q20.

Put these values in order with the smallest first

5^2 $\qquad$ 3^2 $\qquad$ 3^3 $\qquad$ 2^3

smallest $\qquad\qquad\qquad\qquad\qquad$ largest

1 mark

Q21.

Write a cross on the numbers that are <u>not</u> square numbers.

1^2　　　2^3　　　3^3　　　4^3　　　5^3

1 mark

Mark schemes

Q1.

3 **AND** 5 **AND** 7

Numbers may be given in any order.

[1]

Q2.

All four pairs of prime numbers listed, ie:

•   5 and 31

    7 and 29

    13 and 23

    17 and 19

For 2m, accept all prime numbers listed in pair order, ie:
• 5, 31, 7, 29, 13, 23, 17, 19

2

or

Three or four correct pairs of prime numbers listed and not more than
one incorrect pair of numbers

For 1m, accept all eight prime numbers listed, and no other
numbers, without any indication of how the numbers are
paired, eg:
• 5, 7, 13, 17, 19, 23, 29, 31

1

[2]

Q3.

49 **AND** 81

OR

121 **AND** 9

Numbers may be given in either order.

U1

[1]

Q4.

Award **TWO** marks for the correct answer of 378

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

•   366 369 372 375 378 381

364 371 378 385

OR

•   Factorisation/calculator method, eg

7 × 3 = 21

21 × 18

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

Up to 2
U1

[2]

Q5.

Award **TWO** marks for

Joe | 10 | **AND** | 16 |

Joe's even numbers may be given in either order.

AND

Dev | 9 | **AND** | 15 |

Dev's odd numbers may be given in either order.

If the answer is incorrect, award **ONE** mark for:

•   three numbers correctly attributed

OR

•   9 **AND** 10 **AND** 15 **AND** 16 with some or all attributed to the wrong child.

Up to 2 (U1)

[2]

Q6.

An explanation which gives a counter-example to illustrate that two odd numbers and an even number can total 50, eg:

•   '46 + 1 + 3 = 50'

•   '20 + 15 + 15 works'

•   '5 and 20 and 25'

OR

an explanation which recognises that two of the numbers could be odd, eg:

•   'You could use two odd numbers to make 10, and then add 40'

- 'Two of the numbers could be 1 and 3'

- 'Odd + odd + even = even'.
  No mark is awarded for circling 'No' alone.
  ***Do not** accept vague or incomplete explanations, eg:*
  - *'You can't divide it by 3'*
  - *'Odd + odd = even'.*
  *If 'Yes' is circled but a correct, unambiguous explanation is
  given, then award the mark.*

U1

[1]

Q7.

Award **TWO** marks for the correct answer of 60 **AND** 90
Numbers may be given in either order.

If the answer is incorrect, award **ONE** mark for:

- both numbers correct and one or more additional factors of 180

eg 30, 45, **60, 90**

OR

- both numbers correct and one number which is not a factor of 180

eg **60, 90**, 100

OR

- one number correct and none incorrect.

eg **60**

Up to 2

[2]

Q8.

| The first | 3 | multiples of | 10 | add to 60 |

1

| The first | 4 | multiples of | 6 | add to 60 |

or

| The first | 2 | multiples of | 20 | add to 60 |

or

| The first | 1 | multiples of | 60 | add to 60 |

1
U1

[2]

Q9.

Two numbers circled as shown:

1

An explanation which recognises that 1003 is not a multiple of 3, eg:

- 'Because 1003 is not divisible by 3'

- 'Because 1003 is not a multiple of 3'

- 'Because 1003 is not in the 3 times table'

- 'Because I divided 1003 by 3 and there was a remainder'

- 'Because 1003 + 3 has a decimal answer'

- 'Because 1 + 0 + 0 + 3 = 4, and 4 is not a multiple of 3'

- 'Because 1003 has a digital sum of 4'

- 'Because 1002 is the nearest in the 3 times table'

- 'Because 1000 is not divisible by 3'

- 'Because 999 is divisible by 3'.

> ***Do not*** *award the mark if additional incorrect numbers are circled.*
>
> *Accept alternative unambiguous indications, eg ticks, crosses.*
>
> *No mark is awarded for circling 'No' alone.*
>
> ***Do not*** *accept vague or arbitrary explanations, eg:*
> - *'Because 1003 ends in 3'*
> - *'Because 1003 is in the third column'*
> - *'Because if you keep going in 3s you will go past it'.*
>
> *If 'Yes' is circled but a correct unambiguous explanation is given, then award the mark.*

U1

[2]

Q10.

Two 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.*

Q11.

36 **AND** 9

Numbers may be given in either order.

[1]

Q12.

An explanation which recognises that the sum of
adding three odd numbers is always odd, eg

- 'Because odd + odd + odd = odd';

- 'Because three odd numbers can't add up to an even number';

- 'Because an odd number of odd numbers makes an odd number'.

    Do not *accept numerical exemplification without further*
    explanation, eg
    - *'Because 21 + 23 + 7 = 51';*
    - *'Because 21 + 23 + 6 = 50'.*
    Do not *accept vague or arbitrary explanations, eg*
    - *'Because 50 is even';*
    - *'Because you can only do it with two odd numbers*

U1

[1]

Q13.

OR

Accept the four numbers listed in any order.

U1

[1]

Q14.

5 and 6 written in the boxes in either order as shown:

OR

[1]

Q15.

0.01   0.05   (0.11)   0.2   0.9

Accept unambiguous alternatives, eg the number crossed or underlined.

[1]

Q16.

3 **AND** 7 **AND** 11

Accept numbers in any order.

[1]

Q17.

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]

Q18.

Any 3-difit number that is a multiple of 14, eg:

3	0	8

Any acceptable answers will be even numbers which divide by 7

Do not accept '0' in the hundreds box.

Only three digit numbers are acceptable.

[1]

Q19.

2 × 3 × 3 × 5

Numbers can be written in any order

[1]

Q20.

2^3 3^2 5^2 3^3

Accept 8, 9, 25, 27

Q21.

1^3 2^3 3^3 4^3 5^3

Accept any unambiguous indication