testbase

Week 3

Multiples, primes and factors

Name: _____

Class: _____

Date: _____

Time: **23 minutes**

Marks: **22 marks**

Comments:

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

2 marks

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

$\boxed{}$ × $\boxed{}$ × $\boxed{}$ = 231

1 mark

3 Circle the **two** prime numbers.

29   39   49   59   69

1 mark

4 Put these values in order with the smallest first

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

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

smallest   largest

1 mark

5 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

6 Find two **square numbers** that total 45

$\boxed{}$ **+** $\boxed{}$ = 45

1 mark

7 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

8 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

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

1   4   7   10   13   16 ...

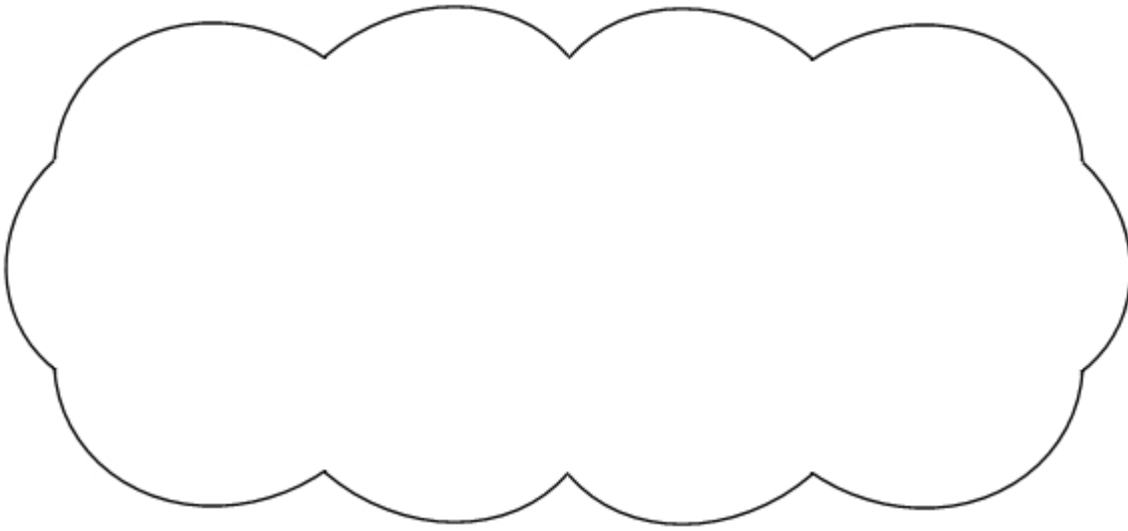The sequence continues in the same way.

Mary says,

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

Is she correct?

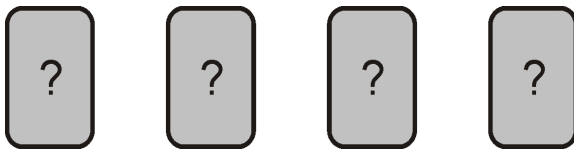Circle Yes or No.

Yes / No

Explain how you know.

1 mark

10 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

11 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.

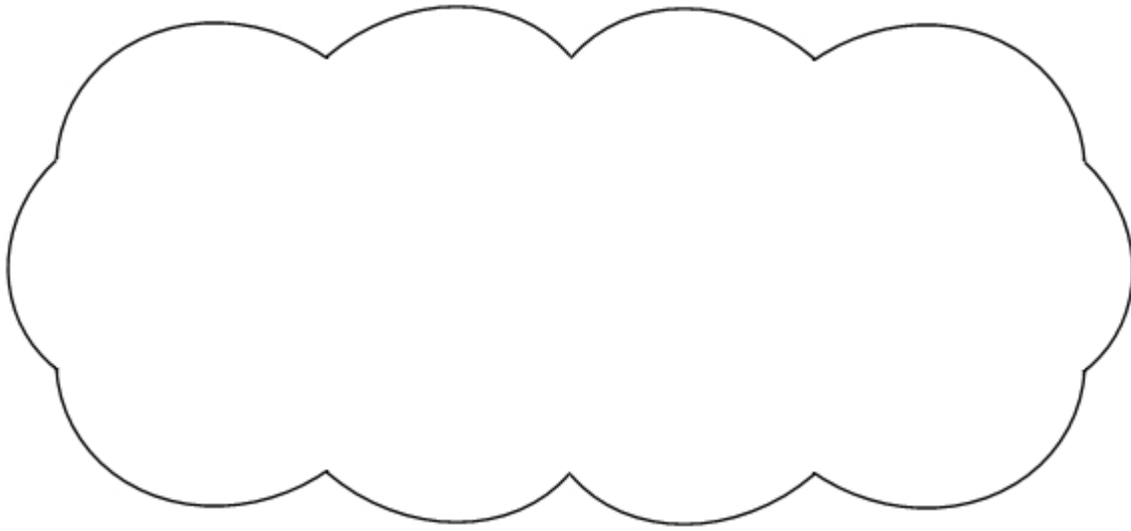| 71 | 72 | 73 | 74 | 75 |

1 mark

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

Yes / No

Explain how you know.

1 mark

12 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 ☐
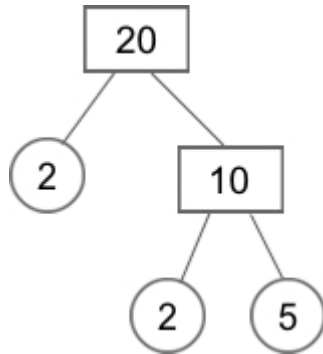
Dev started with ☐ and ☐

2 marks

13

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

14

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

15 Here are three digit cards

| 1 | 5 | 6 |

Choose two cards each time to make the following two-digit numbers.

The first one is done for you.

an even number

| 5 | 6 |

an prime number

| | |

a common factor of 60 and 90

| | |

a common multiple of 5 and 13

| | |

2 marks

16 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

Mark schemes

1 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]

2 3 **AND** 7 **AND** 11

Accept numbers in any order.

[1]

3 Two numbers circled as shown:

(29) 39   49 (59) 69

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

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

[1]

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

                Accept 8, 9, 25, 27

[1]

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

                Accept any unambiguous indication

[1]

6   36 **AND** 9

                Numbers may be given in either order.

[1]

7   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

All 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]

8   49 **AND** 81

OR

121 **AND** 9

                Numbers may be given in either order.

        U1

[1]

9   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]

10 | 2 | | 5 | | 10 | | 20 |

OR

| 4 | | 5 | | 10 | | 20 |

Accept the four numbers listed in any order.

U1

[1]

11 Two numbers circled as shown:

74 **(72)** 73 74 **(75)**

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]

12 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]

13 2 × 3 × 3 × 5

Numbers can be written in any order

[1]

14 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]

15 All three correct
61
15
65

2

or

Any two correct

1

[2]

16 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]