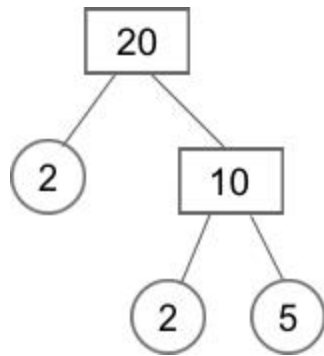**Q1.**

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.

$$90 = \underline{\hspace{3cm}}$$

1 mark

Q2.

Tick the correct phrase to complete the sentence.

A number that is not prime is called a _____

prime factor ☐

square number ☐

composite number ☐

common factor ☐

1 mark

Q3.

Circle **all** the **prime factors** of 30

2   3   5   6   10

1 mark

Q4.

Write the two other **prime numbers** that multiply to make 165

$$5 \times \boxed{} \times \boxed{} = 165$$

Q5.
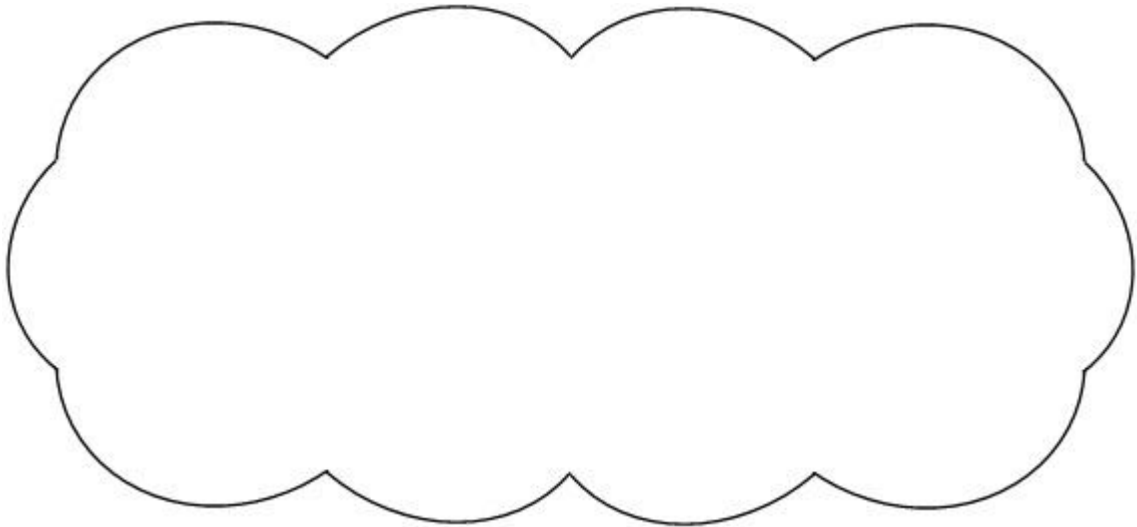
Circle the **prime** number.

95   89   87

Explain how you know the other numbers are **not** prime.

Q6.

The three numbers missing from these boxes are all **prime numbers greater than 3**

Write in the missing **prime numbers**.

$$\boxed{} \times \boxed{} \times \boxed{} = 1001$$

Q7.

Circle the **two** prime numbers.

29   39   49   59   69

Q8.

A **square** number and a **prime** number have a total of 22

What are the two numbers?

	+		= 22

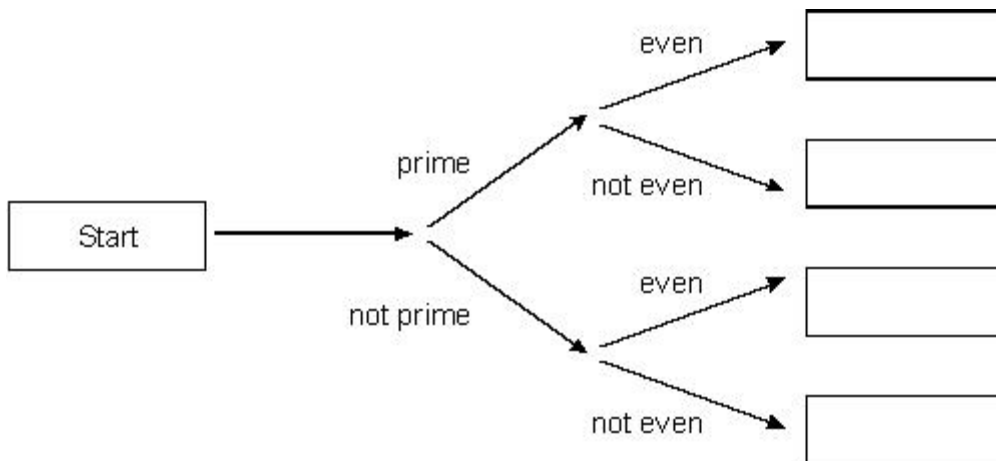square number   prime number

Q9.

Here is a diagram for sorting numbers.

Write these three numbers in the correct boxes.

You may not need to use all of the boxes.

9   17   20

Q10.

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.

_____

Q11.

Millie and Ryan play a number game.

What's my number?

Is it under 20?	Yes
Is it a multiple of 3?	Yes
Is it a multiple of 5?	Yes

What is the number?

1 mark

They play the game again.

Is it under 20?	No
Is it under 25?	Yes
Is it odd?	Yes
Is it a prime number?	Yes

What is the number?

1 mark

Q12.

Chen chooses a **prime** number.

He multiplies it by 10 and then rounds it to the nearest hundred.

His answer is **400**.

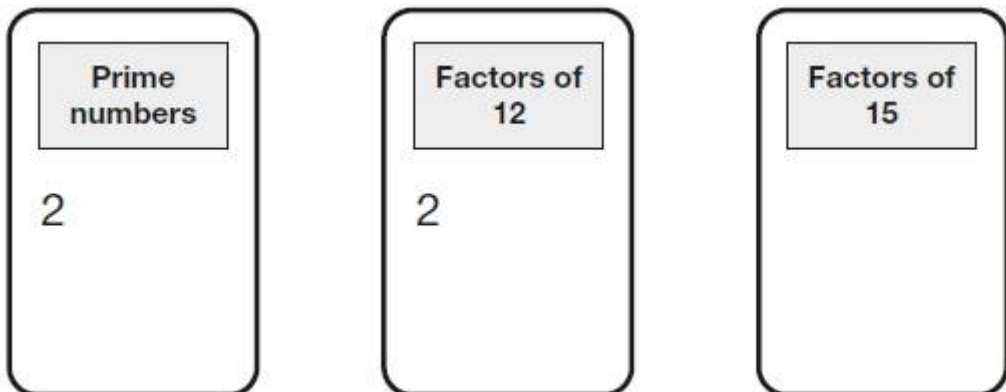Write **all** the possible prime numbers Chen could have chosen.

_____

2 marks

Q13.

Here are five numbers.

2   3   4   5   6

Write each number on the correct cards.

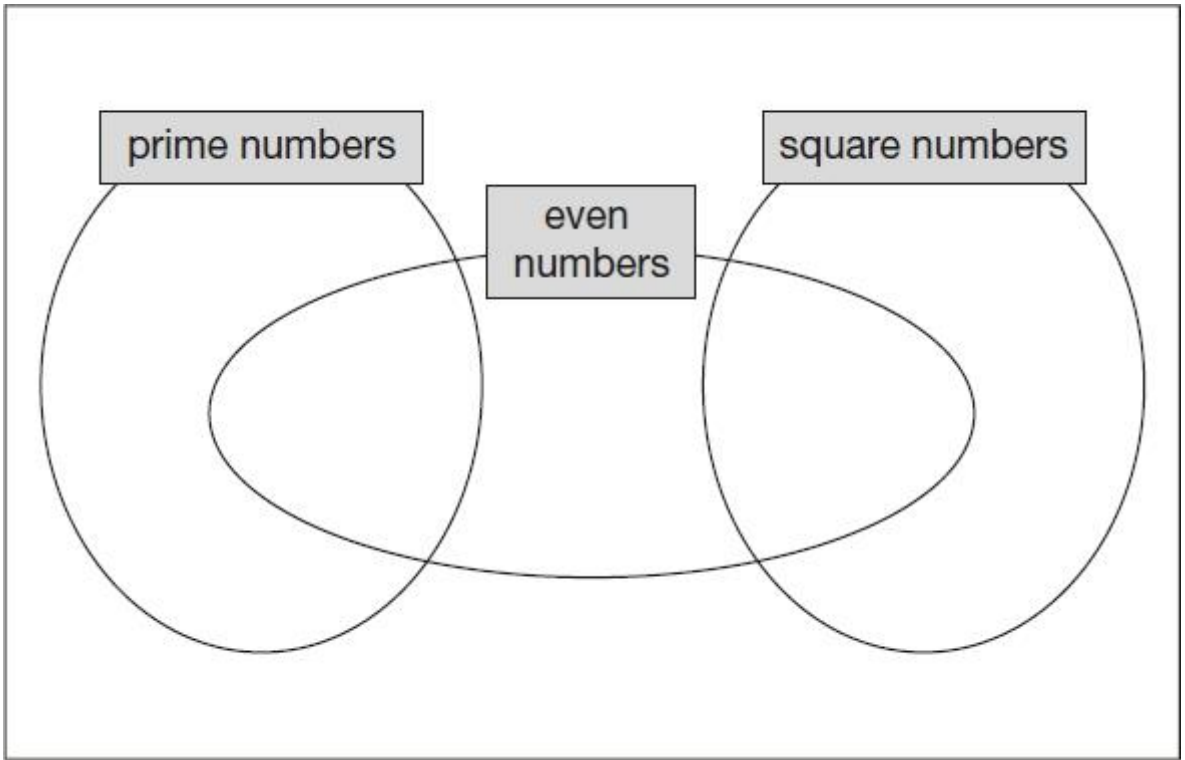The number 2 has been written on the correct cards for you.

Prime numbers	Factors of 12	Factors of 15
2	2	

2 marks

Q14.

Write each number in its correct place on the diagram.

16   17   18   19

2 marks

Mark schemes

Q1.
2 × 3 × 3 × 5

Numbers can be written in any order

[1]

Q2.
Composite number indicated

[1]

Q3.
Award **ONE** mark for 2, 3 and 5 circled only.

[1]

Q4.
3 and 11 in either order.

[1]

Q5.
Award **ONE** mark for a correct explanation of why the 95 **AND** 87 are **NOT** prime, e.g.

- 87 is divisible by 3 and/or 29 **AND** 95 is divisible by 5 and/or 19
- 87 is in the 3 times table **AND** 95 is in the 5 times table
- 95 is divisible by five because every number in the five times table ends in five or zero. 87 is divisible by three because 9 is in the three times table so is ninety. Ninety minus three is 87
- 8 + 7 = 15 and 15 is divisible by 3 **AND** 95 is divisible by 5

    No mark is awarded for circling '89' alone.

    Both non-primes must be explained correctly for the award of the mark.

    Do not accept vague or incomplete explanations, e.g.

    - *The other 2 numbers have more than 2 factors (vague)*

    - *87 is divisible by 3 (incomplete).*

    Do not accept explanations which include incorrect mathematics or incorrect information that is relevant to the explanation, e.g.

    - *3 × 27 = 87*

    - *89 has three factors*

    - *no numbers go into 89*

[1]

Q6.
$\boxed{7}$ × $\boxed{11}$ × $\boxed{13}$

OR any permutation of these

[1]

Q7.

Two numbers circled as shown:

$\left(29\right)$ 39 49 $\left(59\right)$ 69

> ***Do not*** *award the mark if additional incorrect numbers are circled.*
>
> *Accept alternative unambiguous indications, eg numbers ticked, crossed or underlined.*

[1]

Q8.

Both numbers correct as shown:

9	+	13	= 22
square number		prime number	

> *Numbers must be in the correct order.*
>
> ***Do not*** *accept:*

3^2	+	13	= 22
square number		prime number	

[1]

Q9.

Award **TWO** marks for numbers placed in boxes as shown below:

17
20
9

If the answer is incorrect, award **ONE** mark for two numbers correctly placed.

> ***Do not*** *accept a number repeated in different boxes.*
>
> *Ignore any numbers on the diagram other than those given.*

Up to 2

[2]

Q10.

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]

Q11.
    (a)   15

          1

    (b)   23

          1

          [2]

Q12.
Gives only the three correct prime numbers in any order, ie:

- 37, 41, 43

  2

or

Gives at least two correct prime numbers **and** not more than one incorrect number, eg:
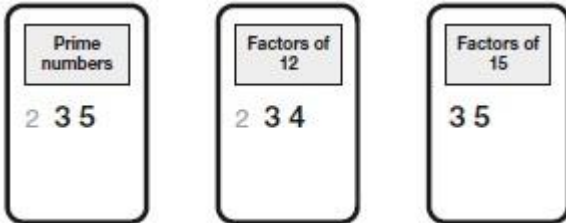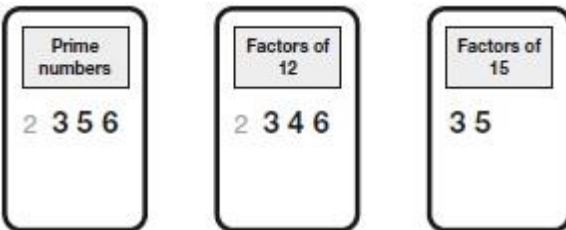
- 37, 39, 41, 43

- 39, 41, 43

- 41, 43

  1

  [2]

Q13.
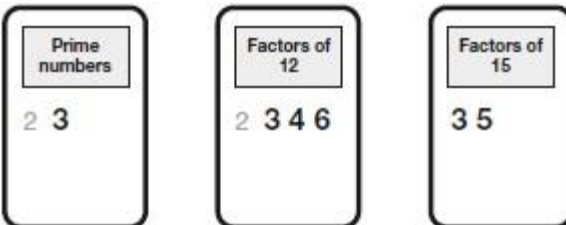Award **TWO** marks for all four given numbers placed completely correctly 7 times, as shown:

Prime numbers	Factors of 12	Factors of 15
2 3 5	2 3 4 6	3 5

If the answer is incorrect, award **ONE** mark for three of the given numbers all placed completely correctly, e.g.

Prime numbers	Factors of 12	Factors of 15
2 3 5	2 3 4	3 5

OR

Prime numbers	Factors of 12	Factors of 15
2 3 5 6	2 3 4 6	3 5

OR

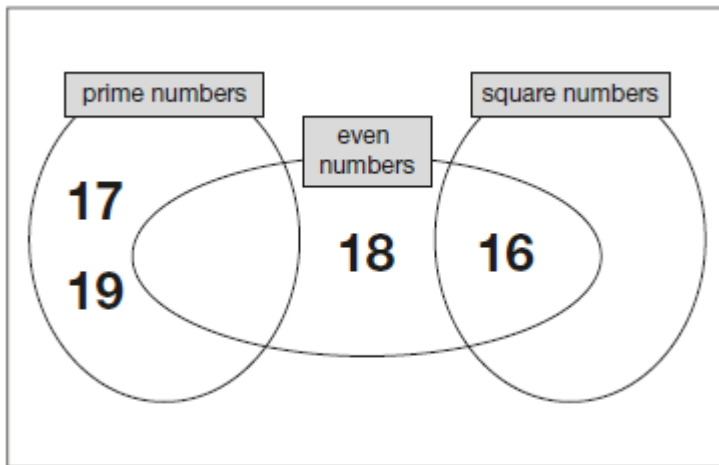| Prime numbers	Factors of 12	Factors of 15
2 3	2 3 4 6	3 5

Accept the numbers in any order.
Ignore any additional numbers not given in the question.

Up to 2m

[2]

Q14.

Award **TWO** marks for all four numbers placed correctly as shown:

Prime numbers region: 17, 19
Even numbers region: 18
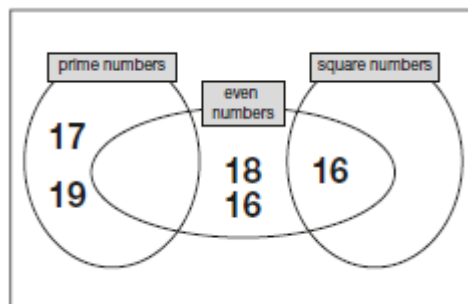Square numbers region: 16

If the answer is incorrect, award **ONE** mark for three numbers placed correctly.

Accept alternative unambiguous indications, e.g. lines drawn from the numbers to the appropriate regions of the diagram.

Do not *accept numbers written in more than one region, e.g.*

OR

Up to 2m

[2]