FOUNDED 1900

THE ENGLISH SCHOOL

A SECOND CENTURY OF EXCELLENCE

ENTRANCE EXAMINATIONS 2021

MATHEMATICS FIRST FORM

Time allowed: 1 hour and 15 minutes

- Answer ALL questions.
- Show all necessary working on the question paper in the spaces provided and write your answers in the appropriate places.
- The marks for each question are given at the end of the question.
- There are 31 questions in this paper.
- The total number of marks is 100.
- If you cannot do a question, move to the next one so you do not lose time.
- **CALCULATORS ARE NOT ALLOWED**.
- **DO NOT WRITE IN THE RIGHT-HAND MARGIN.**

Leave blank

1. Evaluate the following:

(a) $99007 - 2021$

Answer: ……. **(1)**

(b) $3416 \div 28$

Answer: ……. **(1)**

(c) $3\frac{1}{4} - \frac{5}{6}$

Answer: ……. **(3)**

(d) $8\frac{2}{5} \times 1\frac{1}{14}$

Answer: ……. **(2)**

(Total 7 marks)

Q1

Leave blank

2. ***M*** is a whole number greater than 20 and less than 30
N is a whole number greater than 2 and less than 10

(a) What is the smallest number that ***M* × *N*** could be?

Answer: ……. **(1)**

(b) What is the largest number that ***M* − *N*** could be?

Answer: ……. **(1)**

(Total 2 marks)

Q2

3. Emily buys three packets of nuts.
She pays with a €2 coin.
This is her change:

What is the cost of one packet of nuts?

Answer: ……. **(3)**

(Total 3 marks)

Q3

Leave blank

4. Jack finished a run in 23 minutes 25 seconds.
Ally finished 4 minutes 50 seconds after Jack.

(a) How long did Ally take?

Answer: ……. **(2)**

Lewis finished the run 5 minutes 45 seconds before Jack.

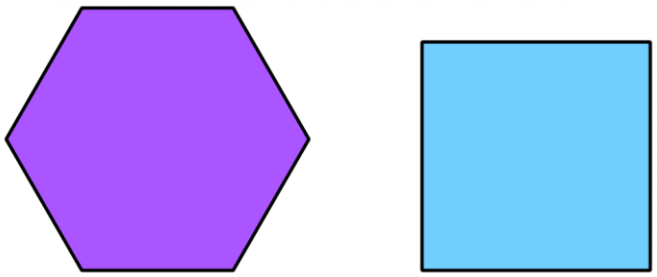
(b) How long did Lewis take?

Answer: ……. **(2)**

(Total 4 marks)

Q4

5. The regular hexagon and the square shown in the diagram below have equal perimeters.
(*The diagram is not accurately drawn*)



The length of each side of the hexagon is 12 cm.

Calculate the area of the square.

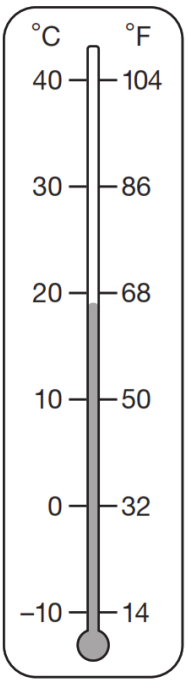
Answer: …….. cm^2 **(3)**

(Total 3 marks)

Q5

Leave blank

6. This thermometer shows temperatures in both °C and °F.
Work out what 35 °C is in °F.



Answer: 35 °C = …… °F **(2)**

Q6

(Total 2 marks)

7. Andy thinks of a whole number.
He multiplies it by 4
He rounds his answer to the nearest 10
The result is 70

Write all the possible numbers that Andy could have started with.

Answer: …… **(3)**

Q7

(Total 3 marks)

Leave blank

8. Here are some number cards.

15	16	17	18	19	20	21	22	23	24	25

Mark picks two even cards.
Alex picks two odd cards.

Mark gives one of his cards to Alex and Alex one of his cards to Mark.

Mark now has two square numbers.
Alex now has two multiples of five.

What numbers did they each start with?

Mark started with ☐ and ☐

Alex started with ☐ and ☐

(2)

(Total 2 marks)

Q8

9.

(a) Find 51% of 900

Answer: ..... **(1)**

(b) If $\frac{3}{7}$ of a number is 24, what is $\frac{5}{8}$ of the same number?

Answer: ..... **(2)**

(Total 3 marks)

Q9

Leave blank

10.

(a) In the sequence below, the term to term difference is always the same.

$$a\ ,\ 2\ ,\ 3\frac{3}{8}\ ,\ 4\frac{3}{4}\ ,\ e\ ,\ \ldots$$

Find the values of a and e.

Answer: a = ……. **(1)**

Answer: e = ……. **(2)**

(b) Find the sum of the terms in the 20th pair of brackets.

$$(1,\ 5,\ 49)\ ,\ (2,\ 10,\ 48)\ ,\ (3,\ 15,\ 47)\ ,\ (4,\ 20,\ 46)\ ,\ ...$$

Answer: ……. **(2)**

(Total 5 marks)

Q10

11. If the three-digit number 8M7 is divisible by 9, find M.

Answer: M = ……. **(2)**

(Total 2 marks)

Q11

Leave blank

12.

(a) Write the three missing digits to make this subtraction correct.

$$\begin{array}{r} \square\ 0\ 1\ 5 \\ -\ 4\ 2\ \square\ 2 \\ \hline 2\ \square\ 8\ 3 \end{array}$$

(2)

(b) Write the five missing digits to make this multiplication correct.

$$\begin{array}{r} \square\square\ 7\ \square\ \times \\ \qquad\qquad 9 \\ \hline 2\ \square\ 5\ \square\ 8 \end{array}$$

(2)

Q12

(Total 4 marks)

13. On Monday, all the children at a school each play one sport.
They choose either basketball or football.
There are 135 children altogether at the school.
37 girls choose to play basketball.
Complete the following table.

	basketball	football	Total
boys	33		
girls			64
Total			

(2)

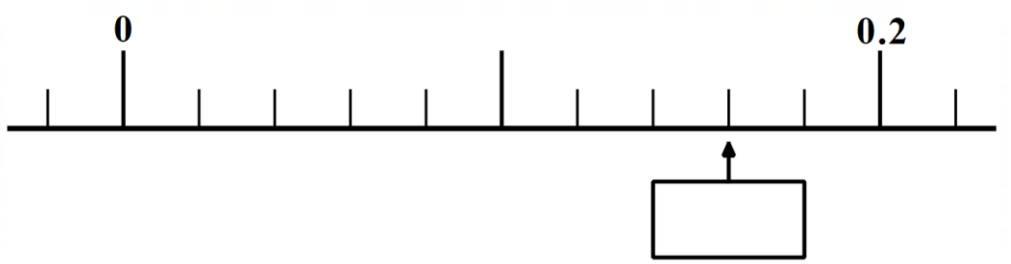
Q13

(Total 2 marks)

Leave blank

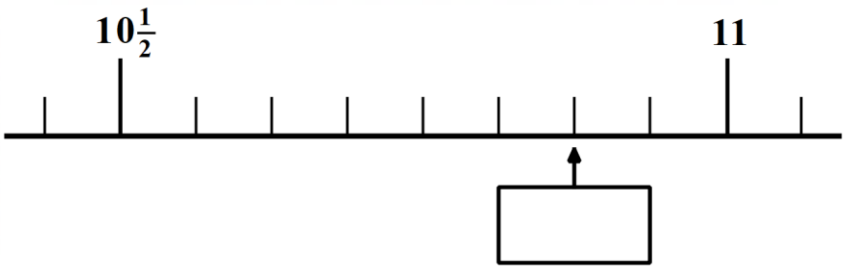
14. Here are parts of two different number lines.
Write in each box the number indicated by the arrow.

(a)



(1)

(b)



(1)

Q14

(Total 2 marks)

15. A bull and three cows cost €1300. Five bulls and ten cows cost €5000.
What is the cost of a bull?

Answer: € ..... **(3)**

Q15

(Total 3 marks)

Leave blank

16. Edna thinks of a two-digit number.
When she divides this number by two the remainder is 1
When she divides this number by three the remainder is 2
When she divides this number by four the remainder is 3
When she divides this number by five the remainder is 4
When she divides this number by six the remainder is 5

Which is Edna's number?

Answer: ..... **(2)**

(Total 2 marks)

Q16

17. Athena is making jam to sell at the school fair.
Strawberries cost €5.50 per kg.
Sugar costs 89 cents per kg.
Ten glass jars cost €8.90
She uses 24 kg of strawberries and 20 kg of sugar to make 40 jars full of jam.

Calculate the total cost to make 40 jars full of jam.

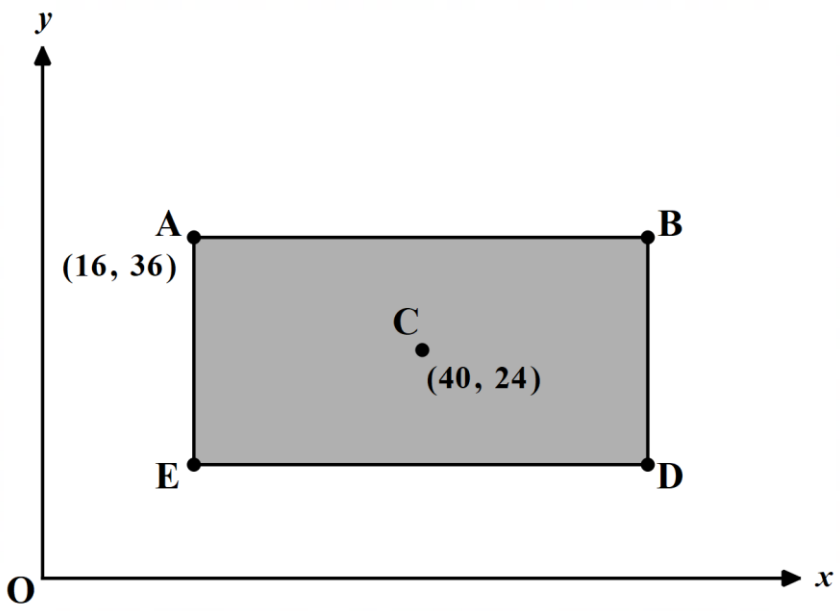
Answer: € ..... **(4)**

(Total 4 marks)

Q17

Leave blank

18. **ABDE** is a rectangle on coordinate axes.
The sides of the rectangle are parallel to the axes.
(*The diagram is not accurately drawn*)



Point **A** has coordinates (16, 36) and **C** (40, 24).
Point **C** is the centre of the rectangle.

What are the coordinates of points **B** and **D**?

Answer: **B** (…… , ……) **(2)**

Answer: **D** (…… , ……) **(2)**

Q18

(Total 4 marks)

Leave blank

19. Use the fact that 397 × 43 = 17071, to work out the missing number:

(a) $3.97 \times \square = 17.071$

(1)

(b) $39.7 \times 43000 = 17071 \times \square$

(1)

(c) $170.71 \div 430 = \square$

(1)

Q19

(Total 3 marks)

20. Will has four apples. The mean (average) mass of the four apples is 85 grams. When Will eats the largest apple, the mean mass of the remaining three apples is 77 grams. What was the mass of the largest apple?

Answer: ..... **(3)**

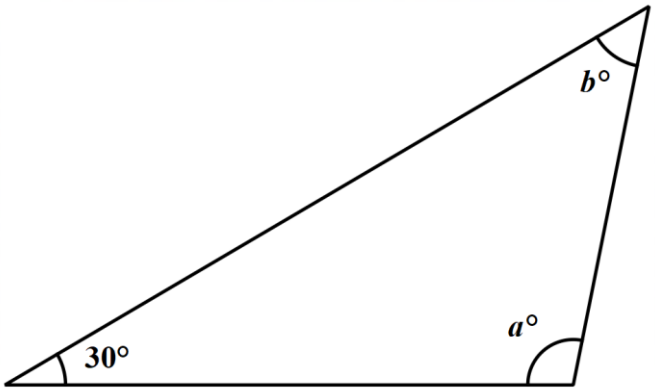
Q20

(Total 3 marks)

Leave blank

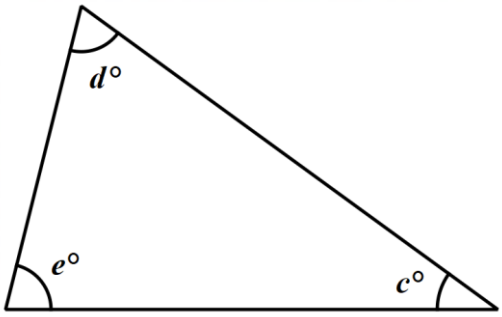
21.

(a) In the triangle below, one angle is 30°. Angle *a* is twice the size of angle *b*. Calculate the value of angle *a*.
(*The diagrams are not accurately drawn*)



a = ……° **(2)**

(b) In the triangle below, angle *d* is twice the size of angle *c* and angle *e* is 40° more than angle *c*. Calculate the value of angle *e*.
(*The diagrams are not accurately drawn*)

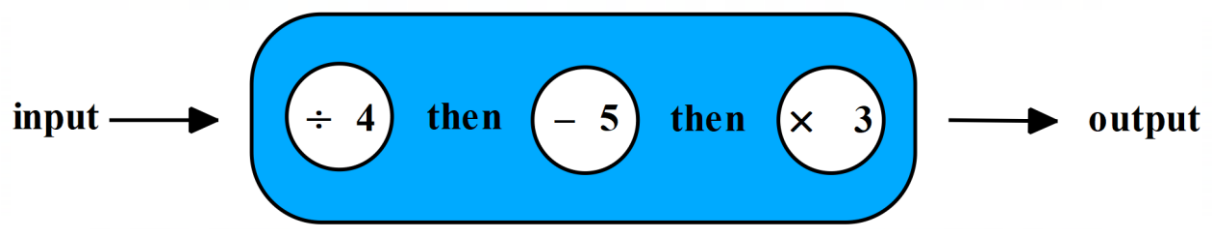


e = ……° **(3)** **Q21**

(Total 5 marks)

Leave blank

22. George has the three-stage number machine shown below.



(a) Work out the output when the input is 48

Answer: ..... **(2)**

(b) Work out the input when the output is 120

Answer: ..... **(2)**

(Total 4 marks)

Q22

23. A barrel is half full of water.
12 litres are poured out.
The barrel is now 20% full.
How much water does the barrel hold when it is full?

Answer: ..... **(2)**

(Total 2 marks)

Q23

Leave blank

24. Philip cuts 4 metres of wood into three pieces.
The length of the first piece is 1.28 metres.
The length of the second piece is 65 centimetres.

Work out the length of the third piece.

Answer: …… m **(2)**

(Total 2 marks)

Q24

25. Neil drives his car for 40 minutes at 45 kilometres per hour.
Mike drives the same distance at 60 kilometres per hour. How long did it take him?

Answer: …… **(3)**

(Total 3 marks)

Q25

Leave blank

26. Josh and Leo have €87 in total.
They each spend €5.
Josh now has 20% more than Leo
How much more money did Josh have than Leo at the start?

Answer: € ..... **(3)**

Q26

(Total 3 marks)

27. Dustin has €800.
He spends 45% of his money on a new bike.
How much does Dustin spend on his new bike?

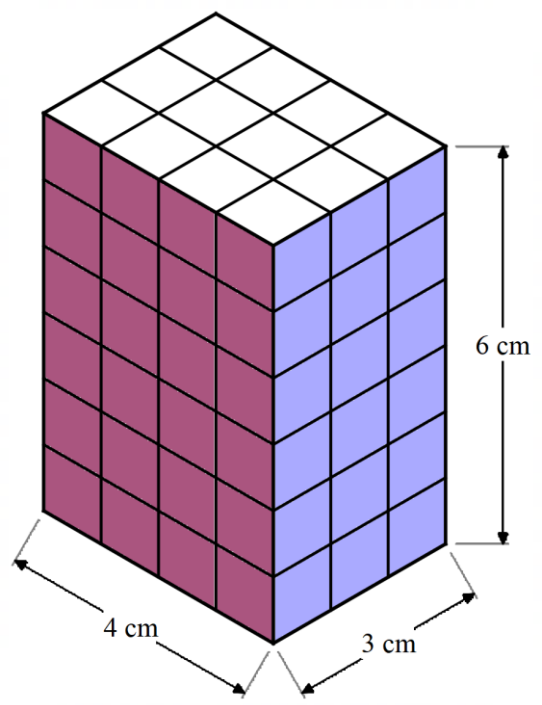
Answer: € ..... **(2)**

Q27

(Total 2 marks)

Leave blank

28. Amina made this cuboid using centimetre cubes.



Stefan makes a cuboid that is 4 cm longer, 4 cm taller and 4 cm wider than Amina's cuboid.

What is the difference between the number of cubes in Amina's and Stefan's cuboids?

Answer: ..... **(4)**

(Total 4 marks)

Q28

29. If the following numbers are placed in order, which number would be in the middle?

$$\frac{3}{10} \ , \ \frac{1}{3} \ , \ \frac{1}{4} \ , \ 0.35 \ , \ 33\%$$

Answer: ..... **(1)**

(Total 1 mark)

Q29

Leave blank

30. A class of students is set a test with 20 questions.
A correct answer scores 5 marks, but a wrong answer loses 3 marks. An answer space left blank scores 0 marks.

(a) Adil answers all the questions, leaving no blank answer spaces and gets 14 correct. What is his score?

Answer: ……. **(2)**

(b) Ben answers 7 out of the 20 questions correctly but leaves 6 answer spaces blank. What is his score?

Answer: ……. **(2)**

(c) Caroline answers all the questions and scores 36 marks. How many questions did she get correct?

Answer: ……. **(2)**

(d) Eva got twice as many correct as she got wrong and scored 35. How many answer spaces did she leave blank?

Answer: ……. **(2)**

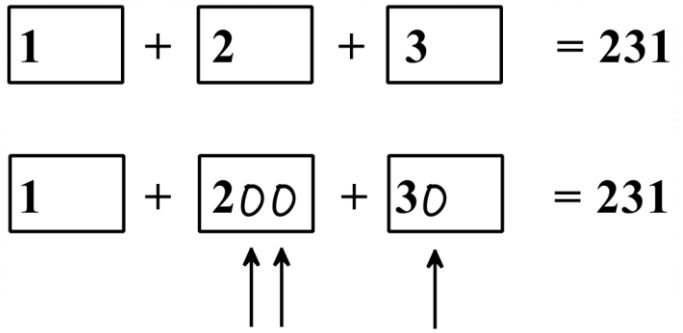
Q30

(Total 8 marks)

Leave blank

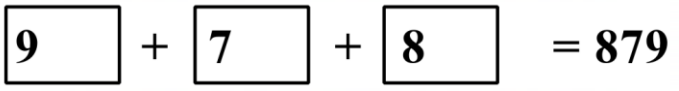
31. In this place value puzzle, you can only add zeros to each number to make them add up to the answer given.

For example:



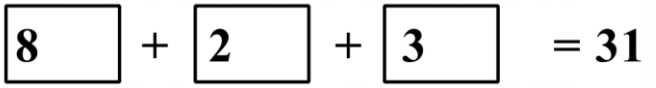
Complete the following:

(a)



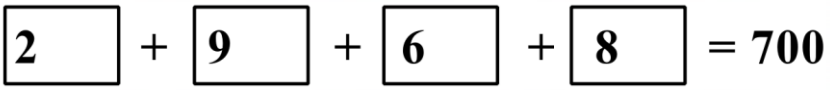
(1)

(b)



(1)

(c)



(1)

Q31

(Total 3 marks)

END

TOTAL : 100 MARKS