FOUNDED 1900
THE ENGLISH SCHOOL
A SECOND CENTURY OF EXCELLENCE

ENTRANCE EXAMINATION 2024

MATHEMATICS – YEAR 1

Time allowed: 1 hour and 15 minutes

General Instructions:

- Answer ALL questions in your question paper.
- Show all necessary workings 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 28 questions in this paper.
- The total mark 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**

GOOD LUCK!

Leave blank

1. Fill in each box with one of the symbols $+$, $-$, $\times$, $\div$ to make the calculations correct.
You should use a pencil and rubber. Ensure your final answer is clear.

$$6 \square 4 \square 9 = 15$$

$$(18 \square 12) \square 6 = 5$$

(3) Q1

(Total 3 marks)

2. What is 15% of the sum $3\frac{1}{2} + \frac{7}{4} + 0.75$?

Answer: …… **(4) Q2**

(Total 4 marks)

3. Cameron has four cards, each with a fraction written on it.

$\frac{7}{12}$	$\frac{1}{2}$	$\frac{6}{8}$	$\frac{2}{3}$

Arrange the cards in descending order (largest first).

(3) Q3

(Total 3 marks)

Leave blank

4. (a) Let p be a prime number. Circle **one** expression below, which could also be a prime number.

$2p$ $\quad$ $7p$ $\quad$ $p-4$ $\quad$ p^2 **(1)**

(b) Give an example to justify your answer above.

Answer: ……..…….. **(1)** **Q4**

(Total 2 marks)

5. Here are five cards. One of the cards is removed. The mean of the numbers on the remaining four cards is 6.
Which card was removed? You must show your workings.

Answer: ……..…… **(3)** **Q5**

(Total 3 marks)

6. Nicola thinks of a number. She doubles it, adds 4 to the answer, and then divides the result by 7. The final answer is 2.
Find the number she **first** thought of.

Answer: ……..…… **(3)** **Q6**

(Total 3 marks)

Leave blank

7. The diagram below shows a rectangle and a square. The diagrams are not drawn to scale.

If the shapes have equal perimeters, what is the difference in their area?

Answer: …….…….. cm^2 **(4)** **Q7**

(Total 4 marks)

8. What is the 85^{th} digit in the following pattern 123456789101112131415 16…
You are not expected to write them all out.

Answer: …….…… **(2)** **Q8**

(Total 2 marks)

Leave blank

9. Freddie has eight cards, each with a fraction written on it.

$\frac{1}{8}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{5}$	$\frac{3}{4}$	$\frac{7}{10}$	$\frac{6}{9}$	$\frac{1}{16}$

Use each card once to complete the following equations.

(i) $\square + \square = 1$

(1)

(ii) $\square - \square = \frac{1}{5}$

(1)

(iii) $\square \times \square = \frac{3}{10}$

(1)

(iv) $\square \div \square = \frac{1}{2}$

(1) **Q9**

(Total 4 marks)

10. Two chocolate bars and one bottle of water cost €2.50. One chocolate bar and three bottles of water cost €3.50. How much does one bottle of water cost?

Answer: € …… **(3)** **Q10**

(Total 3 marks)

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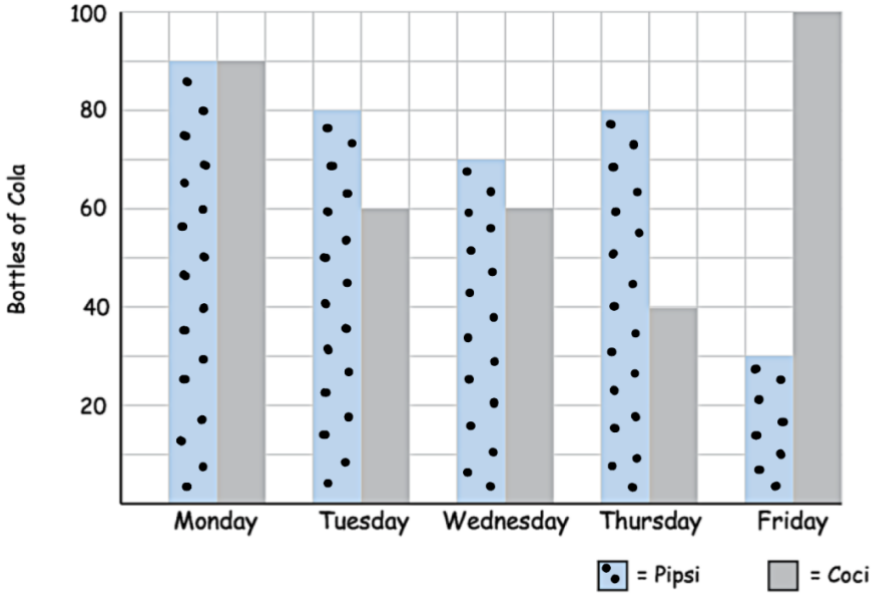
11. The following bar graph shows the sales of 2 brands of cola, Pipsi Cola and Coci Cola, in a convenience store for 5 days.



Use this information to answer the questions.

a) What is the ratio Pipsi to Coci Cola sold on Tuesday?

Answer: …… **(1)**

b) What percentage of the total sales of Pipsi bottles during these 5 days was sold on Wednesday?

Answer: ……% **(2)**

c) On which day did the shop sell 100% more bottles of Pipsi than bottles of Coci?

Answer: …… **(1)**

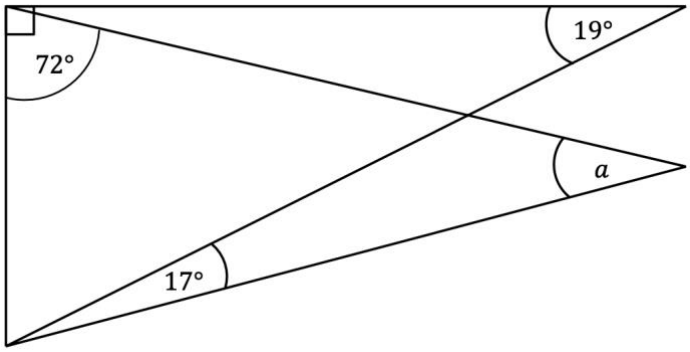
d) The price of a bottle of Pipsi is €0.85 and that of Coci €1.15. What was the total sales revenue of cola from Monday to Friday?

Answer: € …… **(4)** **Q11**

(Total 8 marks)

Leave blank

12. Find the angle a in this diagram.



(*The diagram is not drawn to scale*)

Answer: a = ……. ° **(3)** **Q12**

(Total 3 marks)

13. Robert has been on the road for one hour and fifty minutes. He has been travelling at a constant speed. So far, he has travelled one-sixth of the way to his destination. If he continues at the same speed, he will arrive at his destination at 7:30 p.m.
At what time did Robert start his journey?

Answer: ……. **(3)** **Q13**

(Total 3 marks)

Leave blank

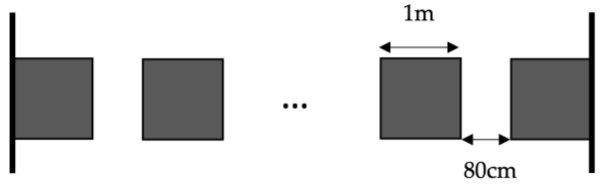
14. Below is a completed addition problem with all the digits replaced by letters.
Every letter represents a single digit, and different letters represent different digits.
Which digit does the letter T represent? Write **two** possible answers.

$$\begin{array}{r} MH \\ MH \\ +MH \\ \hline TM \end{array}$$

Answers: T=…… , …… **(3)** **Q14**

(Total 3 marks)

15. In a school exam hall, the desks are set up, with 80 cm between them, as shown below.



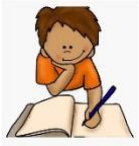
If each desk is 1 m wide and the end desks are put against the wall, how many desks can you fit in a row across a room that is 19 m wide?

Answer: …… **(2)** **Q15**

(Total 2 marks)

Leave blank

16. A maths quiz has ten questions. The student gets 5 marks for every correct answer and looses 1 mark for every incorrect answer.
0 marks are given for a question with no answer.



(a) Poppy gets six answers correct, two answers incorrect and leaves out the last two questions. Find her total score.

Answer: …… **(2)**

(b) Alia did not answer three questions. She scored 29 marks. How many questions did she get correct?

Answer: …… **(1)**

(c) Tanya scored a total of 22 marks. How many questions did she

i) answer correctly?

Answer: …… **(1)**

ii) answer incorrectly?

Answer: …… **(1)**

iii) not answer?

Answer: …… **(1)**

Q16

(Total 6 marks)

Leave blank

17. A sequence is formed by

$$1 \times 2^2, \quad 2 \times 3^2, \quad 3 \times 4^2, \quad ....$$

(a) Find the next two terms of the sequence.

Answers: ……..…… , …… **(2)**

(b) Find the value of the 10^{th} term of the above sequence.

Answer: ……..…… **(2)** **Q17**

(Total 4 marks)

18. The Maths School has an election for its school council.
There are four candidates: George, Nick, Alex and Maria.
540 students voted in the election.
5% of the votes were for George.
Nick received $\frac{2}{9}$ of the votes.
The ratio of the number of votes for Alex and for Maria was 2:1.
How many votes did the winner receive?

Answer: ……..…… **(5)** **Q18**

(Total 5 marks)

Leave blank

19. A teacher makes some biscuits to sell at a school bake sale. The recipe uses flour, butter, and milk.

Recipe for 12 biscuits

300 g flour
125 g butter
200 ml milk

Cost of ingredients

1.5 kg flour: 80 cents
250 g butter: 85 cents
2 litres of milk: €1.90

What is the cost of ingredients to make 120 biscuits?

Answer: € …… **(4)** **Q19**

(Total 4 marks)

20. An operation on two real numbers is defined by the rule $\boldsymbol{a \otimes b = b^a + 2ab}$
For example,

$$\mathbf{5 \otimes 2 = 2^5 + 2 \cdot 5 \cdot 2 = 32 + 20 = 52}$$

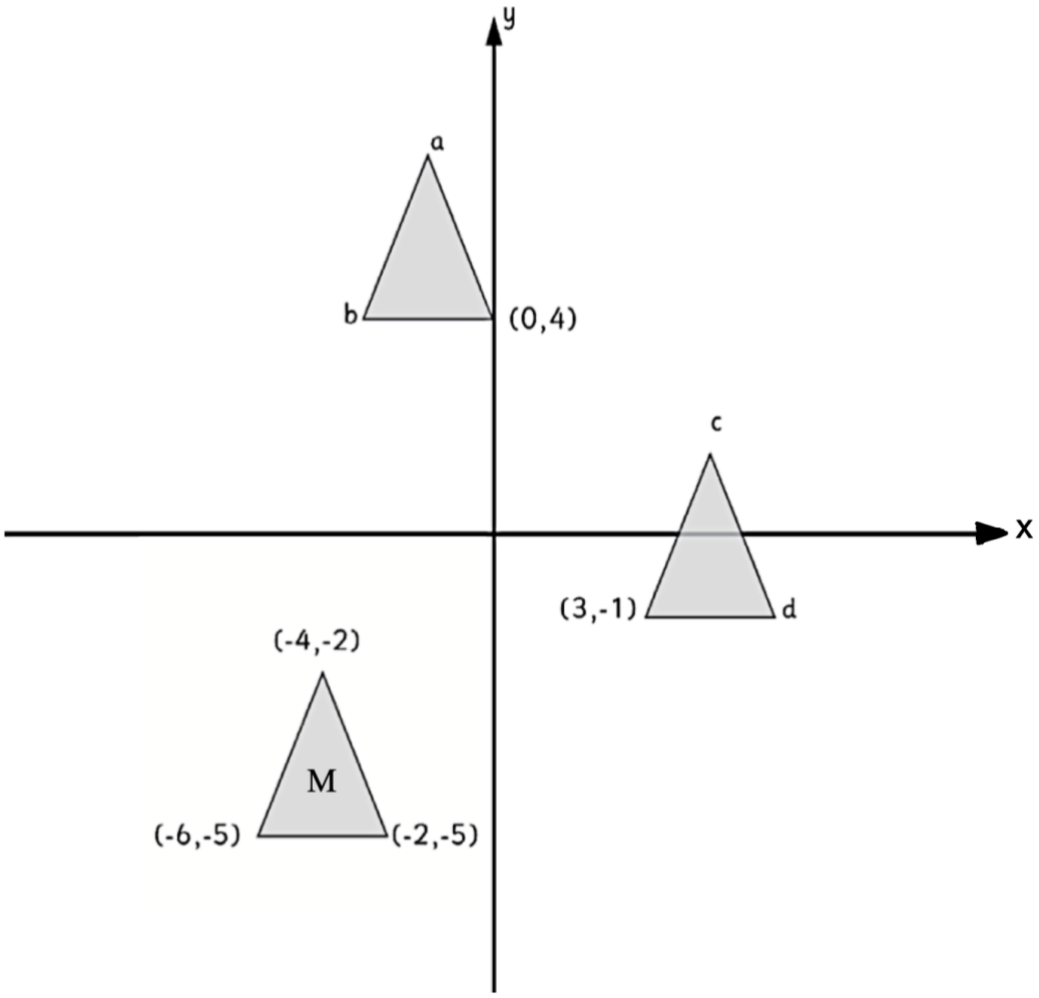
Calculate the value of $\mathbf{2 \otimes (1 \otimes 3)}$

Answer: …… **(4)** **Q20**

(Total 4 marks)

Leave blank

21. Here are 3 identical shaded isosceles triangles on coordinate axes.



(*The diagram is not drawn to scale*)

(a) Write the coordinates of points a, b, c and d.

a	
b	
c	
d	

(4)

(b) Find the area of the triangle M.

Answer: ……..……... **(2)**

Q21

(Total 6 marks)

Leave blank

22. A car travelling from city A to city C completes the journey in 3 hours, whereas a person travelling on a bike completes the same journey in 5 hours. What is the speed of the person on the bike if the car is travelling at 45 km per hour?

Answer: …….…….. km per hour **(3)** **Q22**

(Total 3 marks)

23. The grid below contains numbers where all rows, columns and diagonals have the same **product**. Complete the grid.

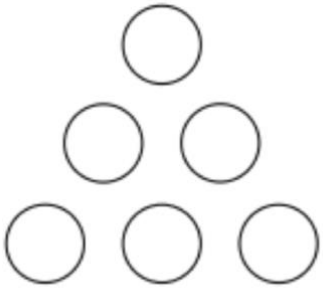
8		$\frac{2}{5}$
	2	
	$\frac{8}{5}$	$\frac{1}{2}$

(3) **Q23**

(Total 3 marks)

Leave blank

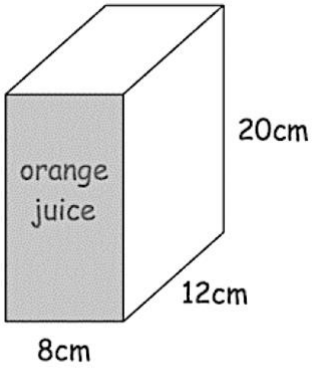
24. Nayia wants to put the numbers 2, 3, 4, 5, 6 and 10 into the circles so that the products of the three numbers along each side of the triangle are the same and as **large** as possible. What is this product? Show your work by completing the circles.



Answer: …… **(3)** **Q24**

(Total 3 marks)

25. A carton of orange juice (shown below) is a cuboid. The depth of orange juice in the carton is 10 cm.
The carton will turn so that it stands on the shaded face. Work out the depth of the orange juice when the carton is turned.



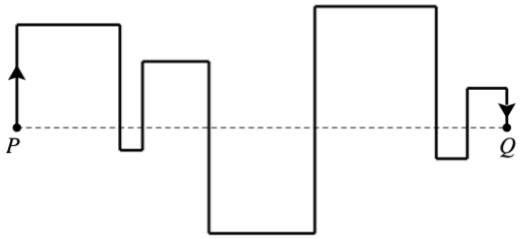
(*The diagram is not drawn to scale*)

Answer: …… cm **(3)** **Q25**

(Total 3 marks)

Leave blank

26. The length of the dashed horizontal line is 12 cm. Seven squares are constructed as shown in the diagram – four above and three below the horizontal dashed line. Find the length, in cm, of the continuous solid path from P to Q, as indicated by the arrows.

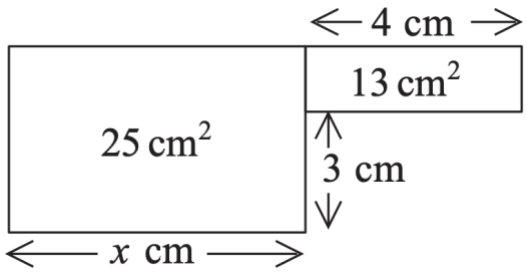


(*The diagram is not drawn to scale*)

Answer: …… cm **(2)** **Q26**

(Total 2 marks)

27. The areas of the two rectangles in the diagram are 25 cm^2 and 13 cm^2, as indicated. Find the value of x.



(*The diagram is not drawn to scale*)

Answer: x =…….. cm **(4)** **Q27**

(Total 4 marks)

Leave blank

28. Jessica and Sarah are working together to prepare dinner for their families. They want to make sure that all the food is finished at the same time. They need to prepare fried chicken, potato croquettes, roasted cauliflower and a salad.

- The chicken needs to be crumbed 30 minutes before it's cooked. Then it will be fried for 6 minutes.
- The potato croquettes take 20 minutes to prepare. They then need to be cooked for 11 minutes.
- The cauliflower needs to be baked for 26 minutes.
- The salad takes 12 minutes to prepare.

If they start cooking at 5:30 p.m., state what time dinner will be ready. Then, use the table to specify the times that Jessica and Sarah should start making each component of the meal and order the tasks from 1 to 6 (where 1 means the task should start first and 6 means the task should start last).

Dinner will be ready at _____

TASK	TIME TO START	ORDER (1-6)
Crumb chicken	_____	
Fry chicken	_____	
Prepare potato croquettes	_____	
Cook potato croquettes	_____	
Bake cauliflower	_____	
Prepare the salad	_____	

Q28

(Total 3 marks)

TOTAL: 100 MARKS

END