Junior Maths Mastery Challenge 2025

Paper E

Student Name: _____

Student No.: _____

DO NOT OPEN THIS BOOKLET UNTIL INSTRUCTED.

Calculators are **not** allowed.

Read the instructions on the **answer sheet** and fill in your **name**, **school** and **other information**.

Record your answers in your **answer sheet**.

You have **1 hour 30 minutes** to answer all 25 questions.

Junior Maths Mastery Challenge (2025)

100

Paper E

Section A (70 marks)

Questions 1 to 10 carry 3 marks each.

1. Find the sum of the whole numbers from 1 to 100.

$$1 + 2 + 3 + 4 + \ldots + 97 + 98 + 99 + 100$$

(A) 5000 (B) 5005 (C) 5050

(D) 5500 (E) 10 000

2. The value of 12 divided by 7 is 1.714 285 714 285....
Find the sum of the first 50 digits after the decimal point.

(A) 216 (B) 217 (C) 223

(D) 224 (E) 225

3. The sum of five consecutive numbers is 2025. Which of the following is one of the numbers?

(A) 400 (B) 402 (C) 403

(D) 408 (E) 410

4. $\frac{P}{Q}$ is a proper fraction. The sum of $\frac{P}{Q}$ and $\frac{Q}{P}$ is $4\frac{37}{42}$. What fraction is $\frac{P}{Q}$?

(A) $\frac{1}{42}$ (B) $\frac{2}{21}$ (C) $\frac{3}{14}$

(D) $\frac{6}{7}$ (E) None of the above

5. Find the value of the following.

$$(\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{5}+\frac{1}{6})+(\frac{2}{3}+\frac{2}{4}+\frac{2}{5}+\frac{2}{6})+(\frac{3}{4}+\frac{3}{5}+\frac{3}{6})+(\frac{4}{5}+\frac{4}{6})+\frac{5}{6}$$

(A) $4\frac{1}{6}$ (B) $5\frac{1}{2}$ (C) $6\frac{5}{6}$

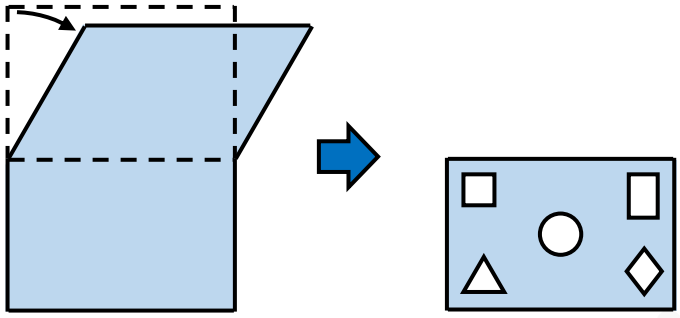
(D) $7\frac{1}{2}$ (E) $8\frac{1}{2}$

6. Eric had a bag of flour. He used $\frac{1}{4}$ of the flour on the 1st day. On the 2nd day, he used $\frac{1}{4}$ of the remaining flour. On the 3rd day, he used $\frac{1}{4}$ of the remaining flour from the 2nd day. What fraction of the flour did he have left?

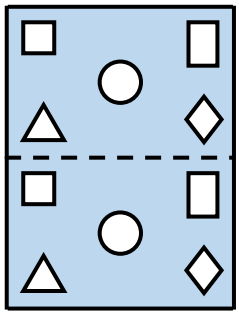
(A) $\frac{1}{64}$ (B) $\frac{5}{64}$ (C) $\frac{3}{8}$

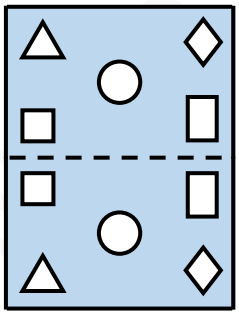
(D) $\frac{27}{64}$ (E) None of the above

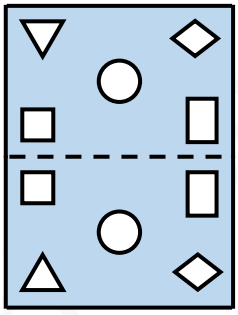
7. Helen folded a piece of paper into half and cut out a few shapes as shown below.

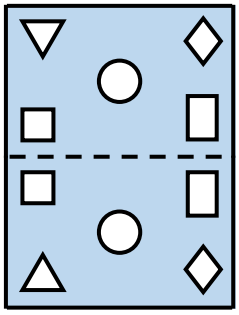


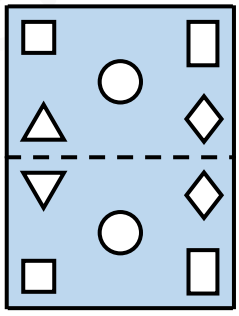
Which of the following shows the paper when unfolded?

(A) 

(B) 

(C) 

(D) 

(E) 

8. Three types of packaging are available in a bookstore.

   Type 1: 8 pencils and 5 erasers for $14
   Type 2: 6 pencils and 10 erasers for $18
   Type 3: 4 pencils and 3 erasers for $8

   Lily wants to give each of her 30 pupils both a pencil and an eraser. Find the minimum amount of money she needs to spend.

(A) $54 (B) $72 (C) $74

(D) $76 (E) None of the above

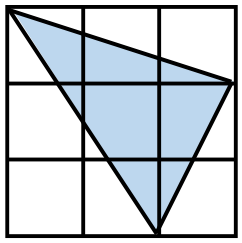
9. The letters P and Q in the following equation represent different whole numbers.

$$\frac{1}{P} - \frac{1}{Q} = \frac{1}{8}$$

Find the greatest possible value of P + Q.

(A) 12 (B) 30 (C) 63
(D) 64 (E) 72

10. The figure is made up of 9 identical squares.



$\frac{14}{\square}$ of the figure is shaded.

What is the missing number in the box?

(A) 16 (B) 18 (C) 24
(D) 27 (E) 36

Questions 11 to 20 carry 4 marks each.

11. What numbers do M and N represent in the following product?

$$4\frac{\boxed{M}}{9} \times \boxed{N}\frac{3}{4} = 33$$

(A) M = 4; N = 6 (B) M = 4; N = 7 (C) M = 4; N = 8

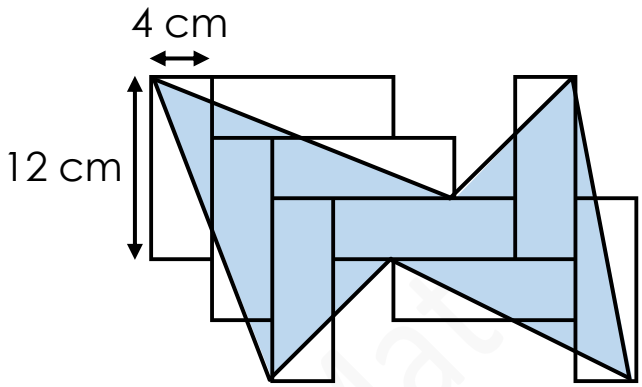
(D) M = 8; N = 6 (E) M = 8; N = 7

12. Amy adds some consecutive numbers starting from 1. She keys in 1 + 2 + 3 + 4 + … in the calculator and gets the result 440. She realises that she has forgotten to include one number. What is the number?

(A) 10 (B) 15 (C) 20

(D) 25 (E) 30

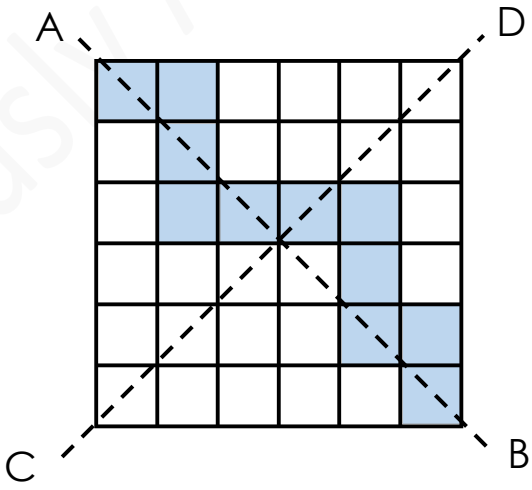
13. The figure is made up of 9 identical rectangles. Find the area of the shaded part.



(A) 296 cm^2 (B) 306 cm^2 (C) 312 cm^2

(D) 320 cm^2 (E) 328 cm^2

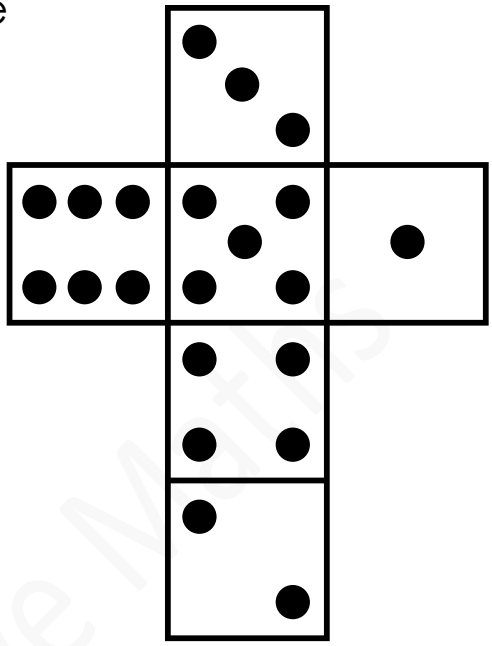
14. What is the minimum number of additional squares that must be shaded to make the figure symmetric about lines AB and CD?

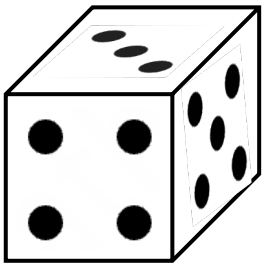


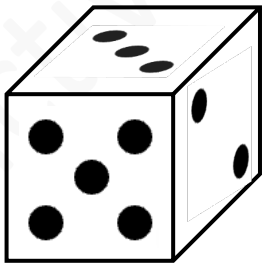
(A) 6 (B) 7 (C) 8

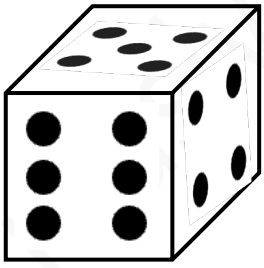
(D) 9 (E) 10

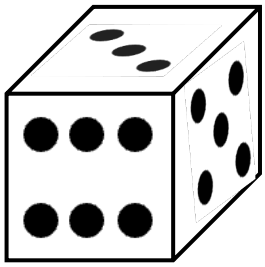
15. Which of the following cubes can be formed by folding the net shown?

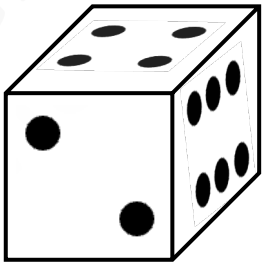


(A) 

(B) 

(C) 

(D) 

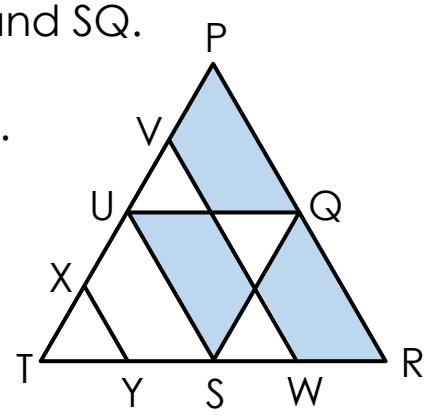
(E) 

16. In a group of pupils, $\frac{1}{5}$ of the boys and $\frac{1}{3}$ of the girls wear glasses. If $\frac{1}{4}$ of the pupils wear glasses, what fraction of the pupils are girls who do not wear glasses?

(A) $\frac{2}{15}$ (B) $\frac{1}{4}$ (C) $\frac{7}{15}$

(D) $\frac{1}{2}$ (E) $\frac{2}{3}$

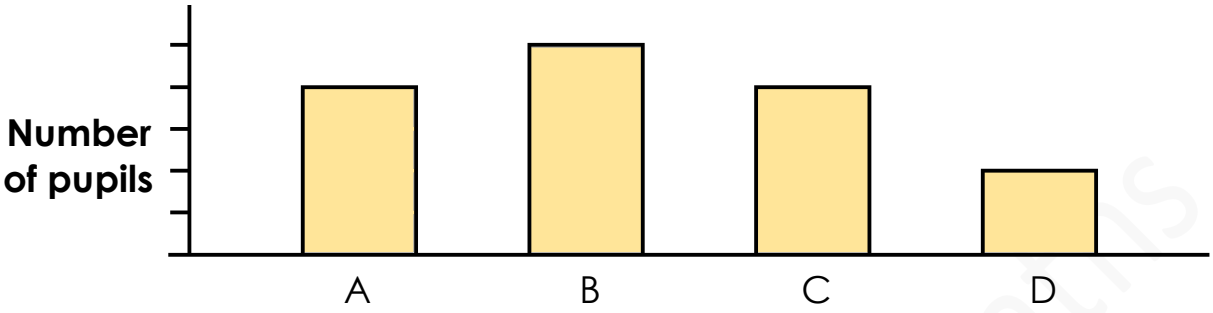
17. In the figure, PRT is an equilateral triangle.
Points U, Q and S are midpoints of the sides of PRT.
Points V, W, X and Y are midpoints of PU, SR, UT and TS respectively. VW, UQ and SQ are straight lines.
VW cuts through the midpoints of UQ and SQ.
The area of the figure is 96 cm^2.
Find the total area of the shaded parts.



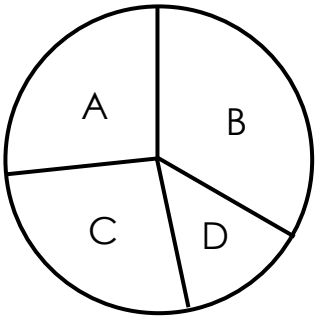
(A) 32 cm^2 (B) 48 cm^2 (C) 54 cm^2

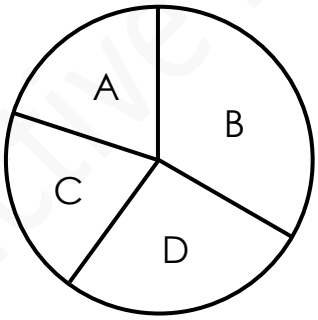
(D) 64 cm^2 (E) None of the above

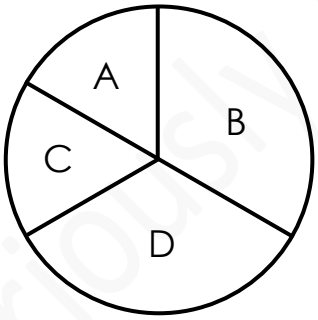
18. The bar graph below shows the number of pupils in four groups.

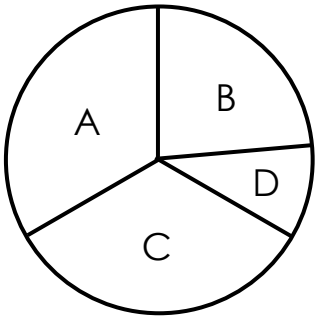


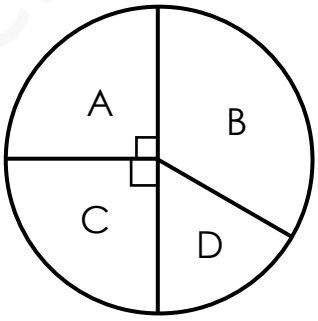
Which of the following pie charts represents the information in the bar graph?

(A)


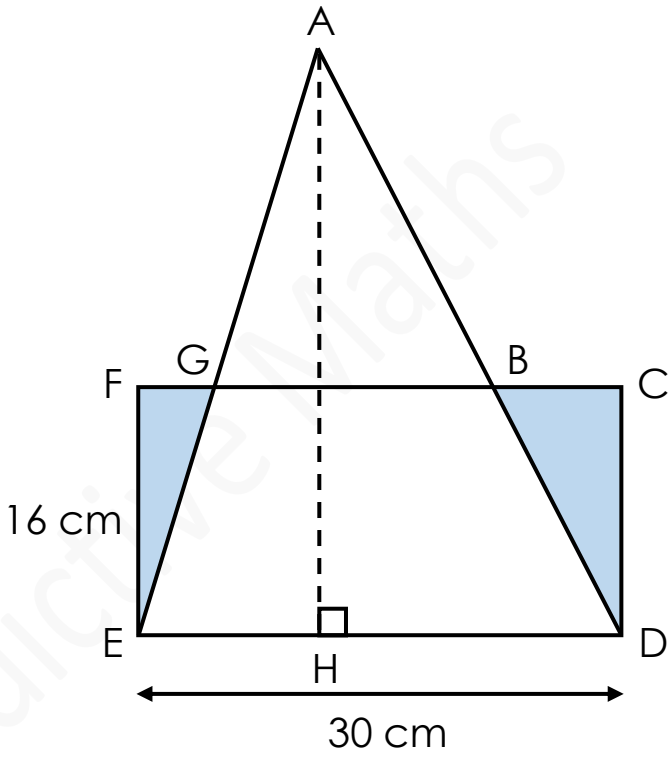
(B)


(C)


(D)


(E)


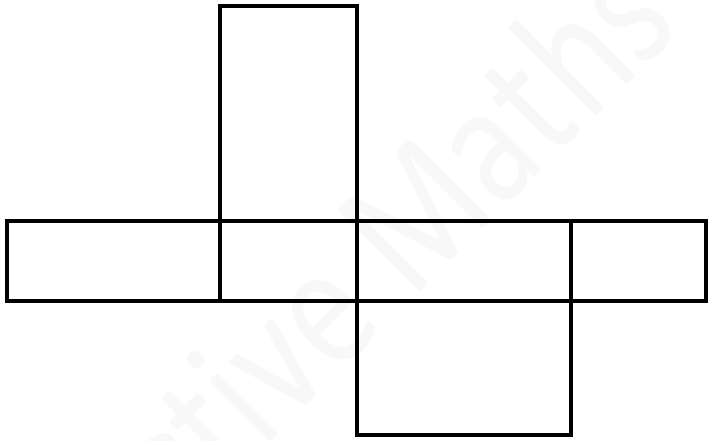
19. In the figure, Triangle ADE and Rectangle FCDE overlap. The area of Triangle ABG is 75 cm^2 more than the total area of the shaded parts. Find the length of AH.



(A) 32 cm (B) 33 cm (C) 34 cm

(D) 35 cm (E) None of the above

20. The figure below is a net of a cuboid.
The perimeter of the figure is 260 centimetres.
The perimeter of the largest face is 80 centimetres.
The perimeter of the smallest face is 52 centimetres.
The net is folded to form the cuboid. Find the volume of the cuboid.



(A) 3510 cm^3 (B) 3600 cm^3 (C) 3840 cm^3

(D) 4368 cm^3 (E) None of the above

Section B (30 marks)

Questions 21 to 25 carry 6 marks each.

21. Nine cards with the digits 1 to 9 are shared equally among Amy, Ben and Cheryl.

    Amy: 'The product of my three digits is 126.'
    Ben: 'The product of my three digits is 24.'
    Cheryl: 'The product of my three digits is 120.'

    Find the sum of the three digits Amy has.

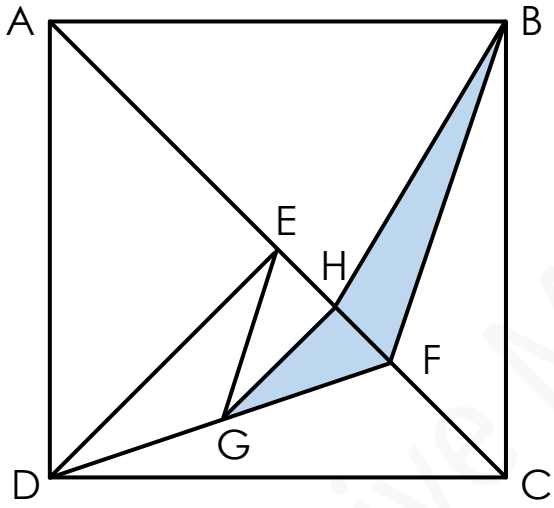
22. Lina and John are playing Rock-Paper-Scissors.

- The winner of each round gets 3 points.
- The loser gets 0 points.
- If it is a draw, both players get 1 point.

After playing 25 rounds, Lina has 43 points and John has 19 points. How many games has Lina won?

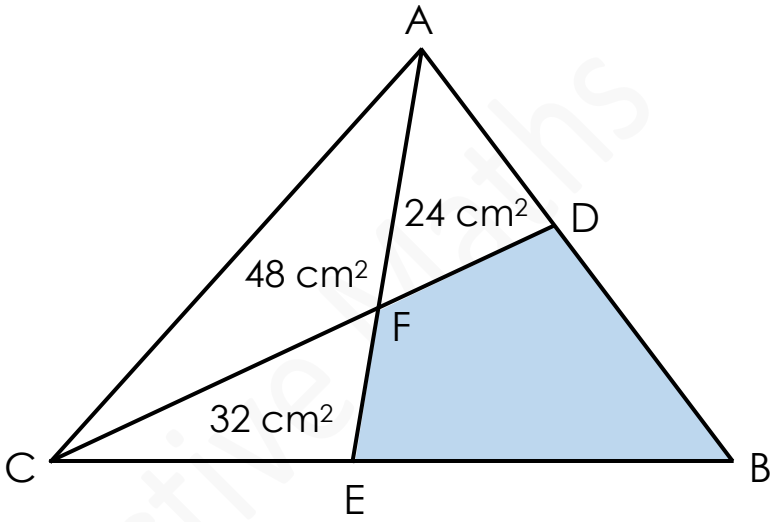
23. The breadth of a rectangular piece of cardboard is $\frac{2}{5}$ of its length. If the length increases by 5 cm and the breadth increases by 3 cm, the area of the cardboard will increase by 215 cm^2. Find the length of the piece of cardboard in centimetres.

24. In the figure, Square ABCD is of sides 16 centimetres. AC and DF are straight lines. Points E, F, G and H are midpoints of AC, EC, DF and EF respectively.



Find the total area of the shaded parts in cm^2.

25. The figure below shows Triangle ABC divided into four parts by two straight lines, AE and CD. The areas of three parts are given in the figure. Find the area of the shaded part in cm^2.



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