Junior Maths Mastery Challenge 2024

Paper C

Student Name: _____

Student No.: _____

DO NOT OPEN THIS BOOKLET UNTIL INSTRUCTED.

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 (2024)

100

Paper C

Section A (70 marks)

Questions 1 to 10 carry 3 marks each.

1. Find the value of the following.

$$100 - 99 + 98 - 97 + 96 - 95 + \ldots + 2 - 1$$

(A) 20 (B) 30 (C) 40

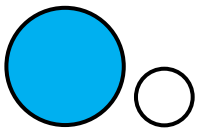
(D) 50 (E) 60

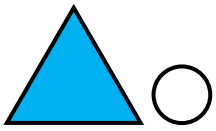
2. A bus has 40 seats. At the 1st stop, 1 passenger boards and sits. At the 2nd stop, 2 passengers board and sit. At the 3rd stop, 3 passengers board and sit, and so on. If no passengers alight, at which stop will all the seats be taken?

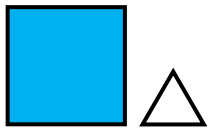
(A) 8th (B) 9th (C) 10th

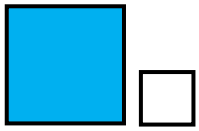
(D) 11th (E) 12th

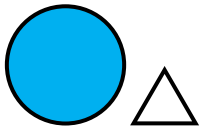
3. Study the following figures. Each figure represents a value.

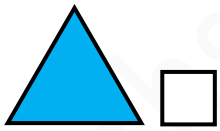
 = 33

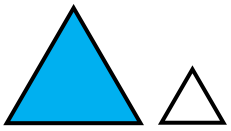
 = 23

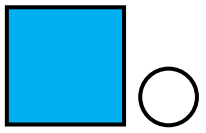
 = 52

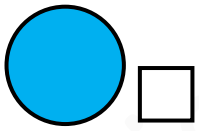
 = 55

 = 32

 = 25

 = 22

 = 53

What number does  represent?

(A) 23 (B) 32 (C) 35

(D) 53 (E) None of the above

4. Some trees are planted at equal intervals of 8 metres along a straight road. One tree is planted at each end of the road. If the road is 960 metres long, how many trees are planted along the road?

(A) 120 (B) 121 (C) 122

(D) 123 (E) 124

5. Ali is given a number. He does the following steps.

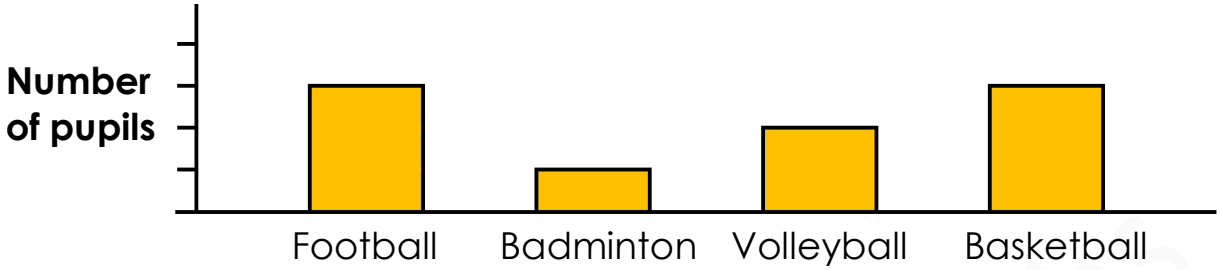
Step 1: Multiply it by 7.
Step 2: Add 7.
Step 3: Divide by 7.
Step 4: Subtract 7 from the quotient.

The result is 7. What number is Ali given?

(A) 12 (B) 13 (C) 22

(D) 23 (E) 112

6. The bar graph shows the favourite sport of 108 pupils.



How many pupils chose volleyball?

(A) 12 (B) 20 (C) 24

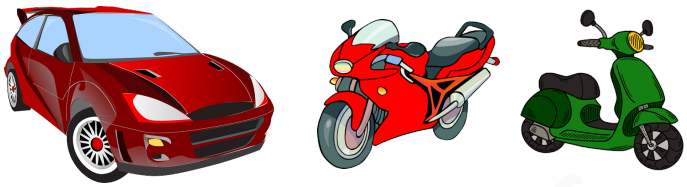
(D) 30 (E) 36

7. Jane wants to distribute 26 egg tarts and 38 cream puffs left over after an event. She finds some boxes and tries to pack an equal number of each pastry into the boxes. What is the maximum number of boxes she has if she is short of 2 cream puffs and has 2 egg tarts left in the end?

(A) 8 (B) 9 (C) 10

(D) 14 (E) 16

8. There are 25 motorcycles, scooters and cars in a car park. There are 68 wheels altogether. How many cars are there?



(A) 7 (B) 8 (C) 9

(D) 14 (E) 16

9. Lisa is 7 years old. She asks her aunt for her age.

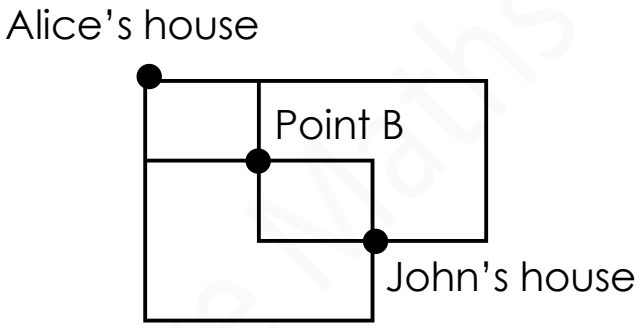
Her aunt replies, 'When you reach my age now, I will be 41 years old.'

How old is Lisa's aunt now?

(A) 23 years old (B) 24 years old (C) 25 years old

(D) 26 years old (E) None of the above

10. The lines in the diagram show the paths from Alice's house to John's house. How many ways are there for Alice to walk from her house to John's house by passing through Point B?
(Alice cannot walk the same path twice.)



(A) 2 (B) 3 (C) 4

(D) 5 (E) 6

Questions 11 to 20 carry 4 marks each.

11. In the cryptarithm below, each letter represents a different digit.

$$\begin{array}{cccc} & A & B & A \\ + & A & B & A \\ \hline C & B & D & E \end{array}$$

Find the number ABA represents.

(A) 343 (B) 454 (C) 676

(D) 787 (E) 878

12. There are 10 red, 13 blue, 20 black and 25 yellow balls in a bag. Without looking into the bag, James removes 1 ball at a time from the bag. What is the minimum number of balls he has to remove so that he will definitely obtain 4 balls of different colours?

(A) 25 (B) 43 (C) 44

(D) 58 (E) 59

13. There were 45 marbles altogether in three boxes, A, B and C. Paul moved 8 marbles from Box A to Box B. He then moved 5 marbles from Box B to Box C. He then moved 2 marbles from Box C to Box A. The three boxes contained an equal number of marbles in the end. How many marbles did Box A contain at first?

(A) 16 (B) 20 (C) 21

(D) 28 (E) 30

14. What is the value of the last 2 digits of the following sum?

$$1 + 11 + 111 + 1111 + \ldots + \underbrace{111\ldots111}_{20 \text{ digits}}$$

(A) 10 (B) 20 (C) 30

(D) 40 (E) 50

15. Three blocks, A, B and C, are of different masses. Study the figures below.

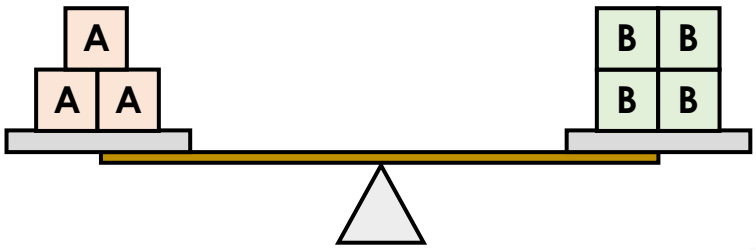


Figure 1

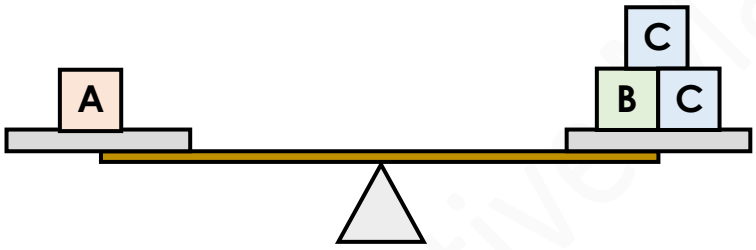


Figure 2

In Figure 3 what must be added to the pan on the right-hand side to make it balanced?

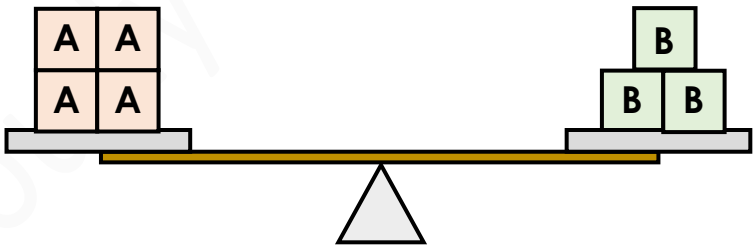


Figure 3

(A) 2 block B's
(B) 2 block C's
(C) 1 block A and 1 block C
(D) 2 block B's and 2 block C's
(E) None of the above

16. Two numbers, P and Q, are formed by the following:

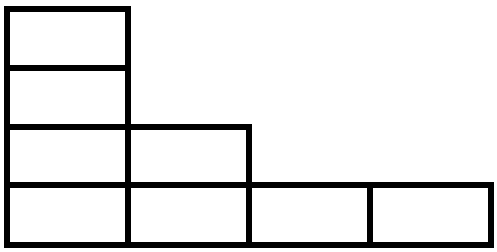
P = 12 × 65

Q = 11 × 66

Which of the following is true?

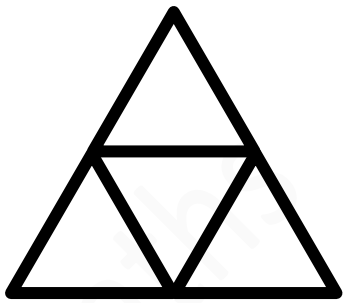
(A) Number P is greater than Number Q.
(B) Number P is smaller than Number Q.
(C) Number P is equal to Number Q.
(D) Not possible to tell
(E) None of the above

17. How many rectangles are there in the figure?



(A) 20 (B) 22 (C) 23
(D) 24 (E) 25

18. 9 sticks are joined to form the frame below. 3 balloons are tied along each stick at equal intervals. Find the minimum number of balloons tied to the frame.



(A) 14 (B) 15 (C) 20

(D) 21 (E) 27

19. A palindromic number is a number that remains the same when its digits are reversed.

For example, 1221, 3333 and 9009 are palindromic numbers.

How many 4-digit palindromic numbers are there?

(A) 80 (B) 90 (C) 95

(D) 100 (E) None of the above

20. Three pupils took a quiz. They made the following statements.

Kelly: I scored an 'A' for the quiz.

Jane: I did not score an 'A' for the quiz.

Tom: Jane did not score an 'A' for the quiz.

If only one of them is telling the truth, which of the following conclusions can we make?

(A) Only Kelly scored an 'A' for the quiz.
(B) Jane did not score an 'A' for the quiz.
(C) Tom did not score an 'A' for the quiz.
(D) Kelly and Jane scored an 'A' for the quiz.
(E) Jane and Tom scored an 'A' for the quiz.

Section B (30 marks)

Questions 21 to 25 carry 6 marks each.

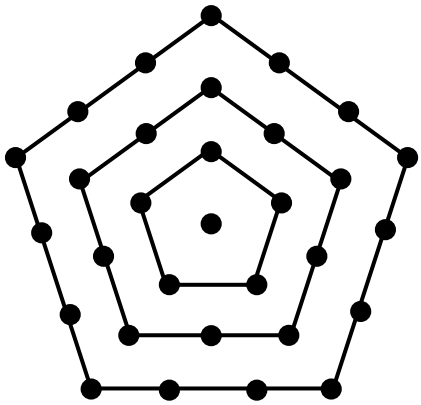
21. John is thinking of two numbers A and B. The sum of the two numbers is 43. If he multiplies Number A by 5 and Number B by 3, their sum will be 163. Find Number A.

22. Study the following pattern.

$3^1 = 3 = 3$
$3^2 = 3 \times 3 = 9$
$3^3 = 3 \times 3 \times 3 = 27$
$3^4 = 3 \times 3 \times 3 \times 3 = 81$
$3^5 = 3 \times 3 \times 3 \times 3 \times 3 = 243$
$3^6 = 3 \times 3 \times 3 \times 3 \times 3 \times 3 = 729$
$\vdots$

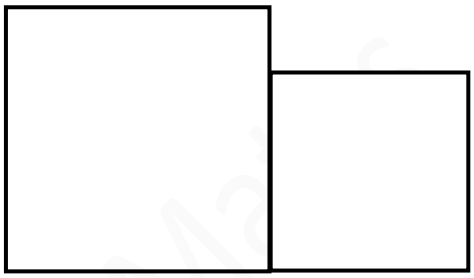
What is the digit in the ones place in 3^{123}?

23. Joe uses pentagons to form the figure below. The figure shows a number pattern.



There is 1 dot in the middle. On the 1st pentagon, there are 5 dots. On the 2nd pentagon, there are 10 dots. On the 3rd pentagon, there are 15 dots. Joe continues until he forms the 5th pentagon. How many dots are there altogether?

24. The figure is made up of two squares. The length of a side of each square is a whole number. Each side of the figure is shorter than 10 centimetres. The area of the figure is 100 cm^2. Find the perimeter of the smaller square.



25. Lisa has 10 cookies. She wants to give them all to her 3 children. Each child gets at least 1 cookie. How many ways can she distribute the cookies among her children?

END OF PAPER

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