# The University of the West Indies, Mona

**presents**

# 2024-2025 Junior Mathematical Olympiad

**Final Round Examination (Grades 5 and 6)**

*For each question, determine the letter corresponding to the correct or best response; along with the question number, indicate this letter by shading it on the answer sheet.*

1. Which of the following calculations give the largest result?

   (A) $2\times0\times2\times5$ (B) $2+0\times2+5$ (C) $2\times0+2+5$ (D) $2+0+2\times5$ (E) $2+0+2+5$

2. What is the largest number in the set

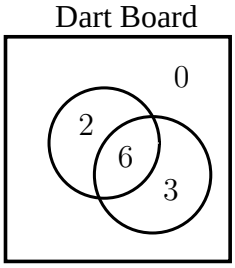
$$W=\left\{\frac{3}{4},\frac{1}{2},\frac{2}{3},\frac{5}{9},\frac{7}{12}\right\}?$$

   (A) 3/4 (B) 1/2 (C) 2/3 (D) 5/9 (E) 7/12

3. Which of the following represents "12 million, 12 hundred and 12?"

   (A) 1201212 (B) 12012012 (C) 121212 (D) 120012012 (E) 12001212

4. Troy throws two darts at the target shown in the diagram. Both his darts hit the target.




   For each dart, he scores the number of points shown in the region he hits. How many different totals can he score?

   (A) 6 (B) 7 (C) 8 (D) 9 (E) 10

5. Spiderman went on a mission. When he left his cabin, a digital clock showed the following time:


When he returns and was hanging upside down, he saw the clock again showing:

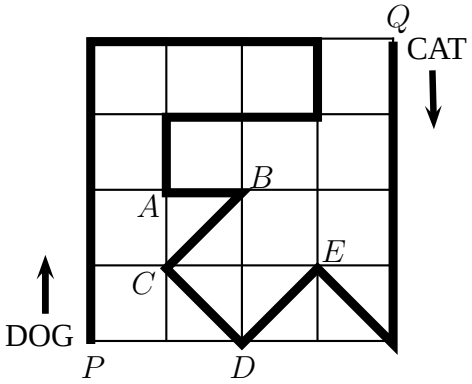

How long was Spiderman away from his cabin?

(A) 3 hrs, 28 mins (B) 3 hrs, 40 mins (C) 3 hrs, 42 mins (D) 4 hrs, 18 mins (E) 5 hrs, 42 mins

6. A 100-step stairway is numbered, from the ground up, from 1 to 100. Alex is about to go up the stairs where his first step will take him to step 1. Emily is about to go down the stairs from step 100. Her first step down will take her to step 99. For every 7 steps Alex makes going up, Emily makes 3 steps going down. On which step number do Alex and Emily meet?

(A) 53 (B) 60 (C) 63 (D) 70 (E) 73

7. A dog and a cat walk in the park along the path marked by the thick black line.




The dog starts from $P$ at the same time that the cat starts from $Q$. The dogs walks three times as fast as the cat. At which point do they meet.

(A) at $A$ (B) at $B$ (C) at $C$ (D) at $D$ (E) at $E$

8. The numbers $31, 32, 33, 34$ and $35$ are five consecutive numbers. Fran writes down four consecutive two-digit numbers. They are in increasing order. Instead of the digits she uses symbols, and the first three of these numbers are

$$\blacksquare\diamondsuit,\ \spadesuit\triangle \text{ and } \spadesuit\blacksquare.$$

What does the fourth number look like?

(A) $\blacksquare\spadesuit$ (B) $\blacksquare\blacksquare$ (C) $\spadesuit\spadesuit$ (D) $\diamondsuit\blacksquare$ (E) $\spadesuit\diamondsuit$

9. At the JMO Summer Camp, participants arrive in teams of 5 or 6 members and the total number of participants is 43. How many teams are at the JMO Summer Camp?

(A) 4 (B) 6 (C) 7 (D) 8 (E) 9

10. In the addition shown, $P$ and $Q$ each represent a single digit:

$$\begin{array}{rr} & 77P \\ & 6QP \\ + & QQP \\ \hline & 1PP7 \end{array}$$

What is the value of $P + Q$?

(A) 13 (B) 9 (C) 14 (D) 12 (E) 15

11. The values in the first row of the following table show the numbers $n$ and the values in the second row of the table show the results after processing $n$.

| $n$ | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Processed $n$ | 1 | 3 | 5 | 7 | 9 |

An expression that is used to process $n$ could be

(A) $3n - 2$ (B) $2(n - 1)$ (C) $n + 3$ (D) $2n$ (E) $2n - 1$

12. The five symbols $\alpha, \bigstar, \beta, \clubsuit$ and $\spadesuit$ used in the equations below, represent different digits.

$$\alpha + \alpha + \alpha = \bigstar \qquad \beta + \beta + \beta = \spadesuit \qquad \bigstar + \spadesuit = \clubsuit$$

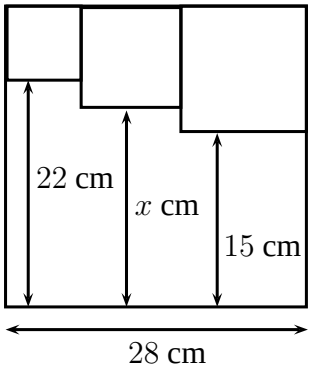
What is the value of $\clubsuit$?

(A) 0 (B) 2 (C) 3 (D) 6 (E) 9

13. Laurin has many identical fudge-sticks. She arranges the fudge-sticks end to end to make different triangles. Which number of fudge-sticks could she NOT use to make a triangle?

(A) 3 (B) 4 (C) 5 (D) 6 (E) 7

14. Three small squares are drawn inside a larger square as shown.




What is the length of the line labeled $x$ cm?

(A) 17 cm (B) 17.5 cm (C) 18 cm (D) 18.5 cm (E) 19 cm

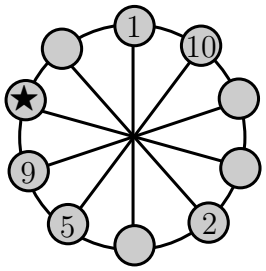
15. In the sequence of letters $OLYMPIADOLYMPIADOLYMPIADOLYMP\ldots$, the word $OLYMPIAD$ is repeated many many times. What is the 2025th letter in the sequence?

(A) $O$ (B) $L$ (C) $Y$ (D) $M$ (E) $P$

16. Bill replaces letters in the calculation $OLY - MPI + AD$ with numbers from 1 to 9 and then calculates the result. Different letters are replaced by different numbers. What is the largest possible result he could get?

(A) 925 (B) 929 (C) 935 (D) 938 (E) 945

17. The numbers from 1 to 10 have to be placed in the small circles, one in each circle. Numbers in any two neighbouring circles must have the same sum as the numbers in the two diametrically opposite circles (the circles directly across on the same diameters).




Some of the numbers are already placed. What number should be placed in the circle with the ★?

(A) 3 (B) 4 (C) 6 (D) 7 (E) 8

18. A box contains seven cards, each with a different integer from 1 to 7 written on it. Armando takes three cards from the box and then Nero takes two cards, leaving two cards in the box. Armando looks at his cards and then tells Nero

    "I know for sure that the sum of the numbers on your cards is even."

    What is the sum of the numbers on Armando's cards?

    (A) 12 (B) 11 (C) 10 (D) 9 (E) 6

19. The sum of three numbers is 50. Kay subtracts a secret number from each of these three numbers. She gets 24, 13 and 7 as the results. Which one of the following is one of the original three numbers?

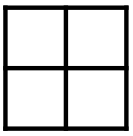
    (A) 9 (B) 11 (C) 13 (D) 17 (E) 23

20. A 3-digit number is called *cool* if its middle digit is greater than the sum of its first and last digits. For example, 173 is cool but 544 is not cool.

    What is the largest possible number of consecutive cool 3-digit numbers?

    (A) 5 (B) 6 (C) 7 (D) 8 (E) 9

21. Subreena has four cards with different counting numbers written on them. Three of these numbers are $2, 3$ and 4. She puts one card in each cell of the $2 \times 2$ grid shown.

    The sum of the two integers in the second row is 6. The sum of the two integers in the second column is 10. Which number is on the card she places in the top left cell?

    (A) 2 (B) 3 (C) 4 (D) 6 (E) Can't be sure

22. Moe has to play 15 games in a chess tournament. At some point during the tournament he has won half of the games he has played, he has lost one third of the games he has played and two have ended in a draw. How many games does Moe still have to play?

    (A) 2 (B) 3 (C) 4 (D) 5 (E) 6

23. Pappa Bear lives with his three cubs. They decide on all matters by votes, with the cubs voting one way and Pappa Bear voting another way. Each member of the family gets as many votes as their age. Pappa Bear's age is 36 and the cubs ages are 13, 6 and 4 years old, so Pappa Bear always win the votes. In how many years from now will the cubs win all votes?

    (A) 5 (B) 6 (C) 7 (D) 13 (E) 14

24. A solid cube of side 1 m is made from smaller cubes, each of side 5 cm. The smaller cubes are placed side by side to form a single row. How long is this row?

    (A) 5 km (B) 400 m (C) 300 m (D) 20 m (E) 1 m

25. Nina counted a total of 60 birds perched in three trees. Five minutes later, 6 birds flew away from the first tree, 8 birds flew away from the second tree and 4 birds flew away from the third tree. Nina notices that there are now the same number of birds in each tree. How many birds were originally perched in the second tree?

    (A) 21 (B) 14 (C) 22 (D) 18 (E) 20