2025 Spring Cup
Mathematical Olympiad

Date: 9 February 2025

Time Given: 1 hour

Level: Primary 4&5

Name: _____

Instruction to Candidates

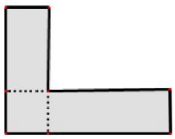
1. Do not open the booklet until you are told to do so.
2. Answer ALL 11 questions.
3. Write your answers in the answer sheet provided and shade the appropriate bubbles below your answers.
4. No steps are needed to justify your answers.
5. Questions 1-4 are worth 8 mark each.
6. Questions 5-8 are worth 10 marks each.
7. Questions 9-11 are worth 16 marks each.
8. No marks will be deducted for wrong answers.
9. Unanswered questions will not get any marks.
10. No calculators or mathematical instruments are allowed.

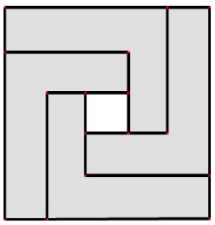
I. Fill in the blanks (8 marks per question, 32 marks in total)

1. $14 + 28 + 57 + 142 + 857 =$_____.

2. January 1, 2025 (New Year's Day) falls on a Wednesday. In year _____ the New Year's Day will again fall on a Wednesday.

3. An L-shaped piece of paper has a perimeter of 14cm. Four such L-shaped pieces are used to form a larger square as shown in the diagram. The corner of the L-shaped paper (marked by dotted lines) is a small square, and its size matches that of the blank small square at the centre of the large square. The perimeter of the large square is _____cm.





4. Yuki bought a new Chinese knot as shown in the diagram. The number of rectangles (including squares) that can be counted in total is _____.

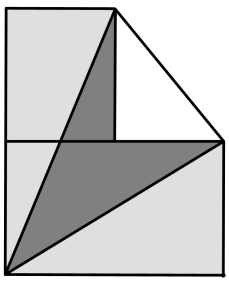
II. Fill in the blanks (10 marks per question, 40 marks in total)

5. With the rapid development of AI technology, a technology company's total number of AI servers at the end of 2024 is more than three times the total at the end of 2023. At the end of 2023, the company had 1,000 AI servers. If the number of new servers added each month in 2024 increases by 20 servers compared to the previous month, then in June 2024, the company added at least _____ servers.

6. As shown, different letter represent different digits, and the same letter represent the same digits. Then $A + B + C + D + E =$ _____.

$$\begin{array}{cccc} A & B & A & C \\ + & A & D & E \\ \hline 2 & 0 & 2 & 5 \end{array}$$

7. Two rectangles are arranged as shown in the diagram below. If the areas of the three shaded regions are 20 each, the area of the blank triangle is _____.



8. Under 5 cups, there are 1, 3, 5, 7, 9 pieces of freeze-dried food respectively. Three children – Alex, Bella and Charlie – each pick one cup and eat the food inside. They have the following conversations:

Alex: I don't know who ate the least or who ate the most.

Bella: I know the amount of food I ate and Alex ate are not multiples of each other.

Charlie: I know the total amount of food that both of you ate.

If all three children are honest, the product of the amounts of food they ate is _____.

III. Fill in the blanks (16 marks per question, 48 marks in total)

9. Three monkeys, A, B and C, are dividing some red and green apples. They play multiple rounds of rock-paper-scissors with the following rules:

The loser of each round takes one green apple

The winner of each round takes one red apple

After several rounds, it is noted that Monkey A's red apples are 10 more than Monkey B's green apples. Monkey A's green apples are 5 more than Monkey C's red apples. Monkey A lost 15 rounds to Monkey B. The number of rounds that Monkey C lost to Monkey A is _____.

10. In a 5×5 grid, place chess pieces according to the following rule: If all 5 squares in a row, a column, or a diagonal contain a chess piece, it is called a "Five-in-a-Row." For example, Figures 1 and 2 each show a valid Five-in-a-Row. In Figure 3, place chess pieces so that there are exactly 4 Five-in-a-Row patterns. The minimum number of chess pieces required is _____.

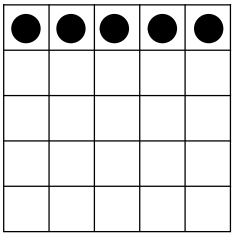


Fig.1

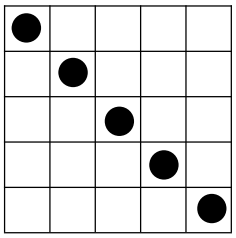


Fig.2

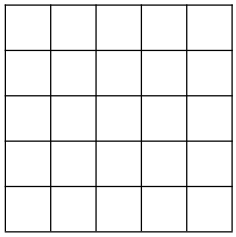


Fig.3

11. In a fixed grid, each square is filled with a number. Each number represents the number of 0s in the adjacent squares (squares that share a common edge or vertex). There are _____ ways where the grid can be filled to satisfy this condition?