



Junior Maths Mastery Challenge Sample

Paper C

Section A

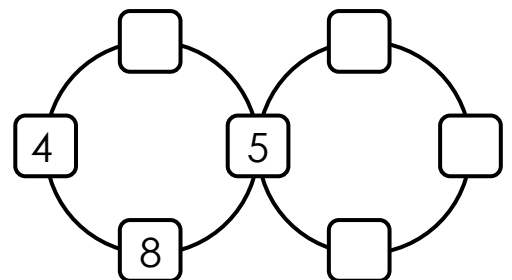
Questions 1 to 5 carry 3 marks each.

1. Find the missing term in the pattern below.

1, 2, 3, 6, 11, 20, 37, _____, 125, ...

- (A) 63 (B) 57 (C) 74
(D) 81 (E) None of the above

2. In the magic circle below, each box is to be filled in with a whole number from 3 to 10 such that the sum of the numbers along each circle is equal. What is the greatest possible sum of the numbers along each circle?
(Each number can only be used once.)



- (A) 24 (B) 25 (C) 26
(D) 27 (E) None of the above



3. A company rented some boats for 52 employees. The boats could seat either 6 or 8 of them. A 6-seater boat cost \$12 to rent. An 8-seater boat cost \$15 to rent. What was the minimum amount the company had to pay to rent the boats?

(A) \$102 (B) \$105 (C) \$108
(D) \$123 (E) None of the above

4. There are 6 blue, 8 yellow, 10 red and 12 green blocks in a box. Without looking into the box, Ken removes 1 block at a time from the box. What is the minimum number of blocks he has to remove so that, for certain, he will obtain 2 blocks of different colours?

(A) 7 (B) 9 (C) 11
(D) 13 (E) 31



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5. A bakery sells 6 types of muffins — blueberry, chocolate, matcha, red velvet, strawberry and vanilla. Eric wants to buy 2 different types of muffins. How many different combinations can he have?

(A) 15

(B) 16

(C) 18

(D) 20

(E) 25



Questions 6 to 10 carry 4 marks each.

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

$$\begin{array}{r} \\ + \\ \hline D \end{array}$$

Find the greatest possible number ABC represents.

(A) 603

(B) 698

(C) 803

(D) 804

(E) None of the above



7. What is the first number from the left in the 10th row of the following pattern?

| | | | | | | | |
|-------|----|----|----|----|----|----|----|
| Row 1 | | | | 1 | | | |
| Row 2 | | | 2 | 3 | 4 | | |
| Row 3 | | 5 | 6 | 7 | 8 | 9 | |
| Row 4 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| | | | | ⋮ | | | |

(A) 84

(B) 86

(C) 88

(D) 90

(E) None of the above



8. Joe adds up consecutive numbers from 1 onwards, $1 + 2 + 3 + 4 + 5 + \dots$. He writes the sum on a piece of paper as he adds the numbers mentally. When he reaches the sum 260, he realises that he has forgotten to add one number. What is the number?

(A) 16

(B) 18

(C) 20

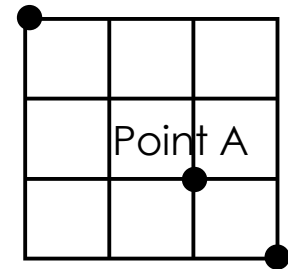
(D) 22

(E) 24



9. The lines in the diagram show the paths from Tim's house to Lisa's house. Tim wants to take the shortest path from his house to Lisa's house, passing through Point A. How many different ways are there?

Tim's house



Lisa's house

(A) 12

(B) 14

(C) 16

(D) 18

(E) 20



10. There were 36 pupils in a classroom. The teacher gave each of them a role, Truth-teller or Liar.

The pupils were given 15 minutes to walk around and shook hands with any other pupil only once. A pupil could choose not to shake hands with anyone. When two pupils shook hands, they would reveal their role only to each other.

After 15 minutes, the teacher asked the pupils, 'How many Truth-tellers did you shake hands with?'

Each pupil answered according to their roles.

A Truth-teller had to give the correct answer and the Liar had to give the incorrect answer. Each pupil gave a different answer, 0, 1, 2, 3, ..., 33, 34 and 35.

How many pupils were Liar(s)?

(A) 0

(B) 1

(C) 18

(D) 35

(E) 36



Section B

Questions 11 and 12 carry 6 marks each.

11. Jane has a digital clock. The clock is set to show time in 24-hour format. From 0:00 to 12:00, how many times does the digit 4 appear?

(You need not include the digits in the seconds.

At 1:44, the digit 4 appears 2 times.

At 1:45, the digit 4 appears 1 time.)



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12. A leap year has 366 days, in which there are 29 days in February. In a certain leap year, there are 5 Fridays in the month of February. On which day of the week is the last day of that year?