Junior Maths Mastery Challenge Sample

Paper D

Section A

Questions 1 to 5 carry 3 marks each.

1. A number is written below. Its digits follow a pattern.

   25719257192571925719…

   Find the sum of its first 52 digits.

   (A) 242 (B) 247 (C) 254
   (D) 255 (E) 264

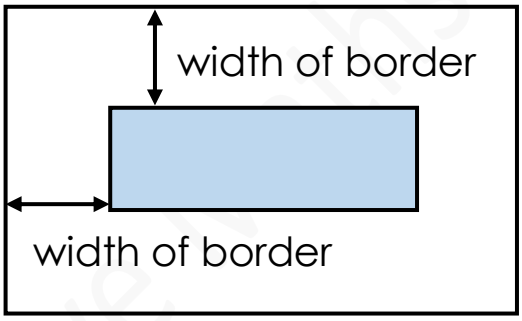
2. How many numbers at most can we select from

   1, 2, 3, 4, 5, …, 46, 47, 48, 49 and 50

   such that the sum of any two numbers is divisible by 5?

   (A) 5 (B) 10 (C) 15
   (D) 20 (E) 25

3. The figure shows a shaded rectangle pasted on a large rectangle, leaving a border of equal width around it. The width of the border is $\frac{1}{3}$ of the breadth and $\frac{1}{5}$ of the length of the large rectangle. If the area of the shaded rectangle is 24 cm^2, find the area of the border.



(A) 32 cm^2 (B) 64 cm^2 (C) 96 cm^2

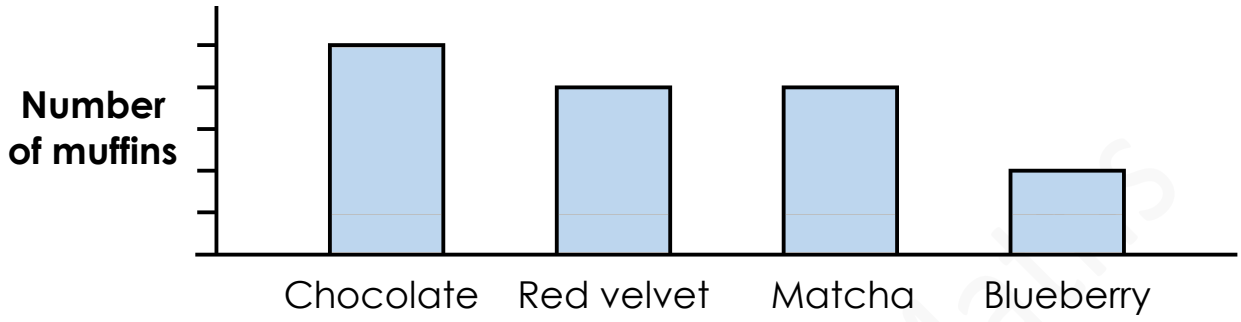
(D) 128 cm^2 (E) None of the above

4. Boxes A, B, C, D and E contain 370 beads altogether.
Boxes A and B contain 160 beads altogether.
Boxes B and C contain 148 beads altogether.
Boxes C and D contain 140 beads altogether.
Boxes D and E contain 128 beads altogether.
How many beads do boxes B and D contain altogether?

(A) 124 (B) 136 (C) 152

(D) 176 (E) None of the above

5. The bar graph shows the number of muffins Lisa sold on Friday.



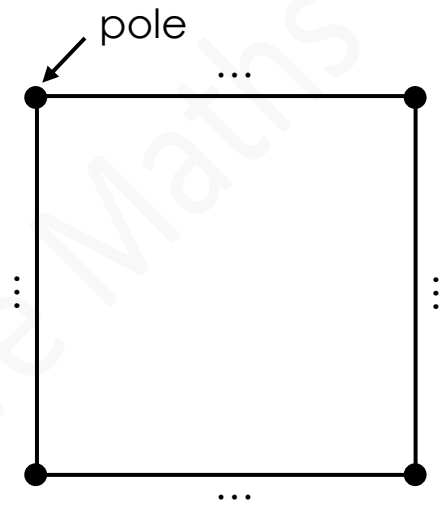
She sold 72 red velvet and matcha muffins altogether. How many more chocolate than blueberry muffins did she sell?

(A) 24 (B) 27 (C) 30

(D) 33 (E) 36

Questions 6 to 10 carry 4 marks each.

6. Tom has a square garden. He places poles at equal intervals of 8 metres along the perimeter of the garden. There is a pole at each corner. He uses 60 poles in total. Find the perimeter of the garden.



(A) 448 m (B) 456 m (C) 472 m

(D) 480 m (E) None of the above

7. What is the ones digit in the following product?

$$2 \times 2 \times 2 \times \ldots \times 2 \times 2 \times 2$$

(A) 2 (B) 4 (C) 6

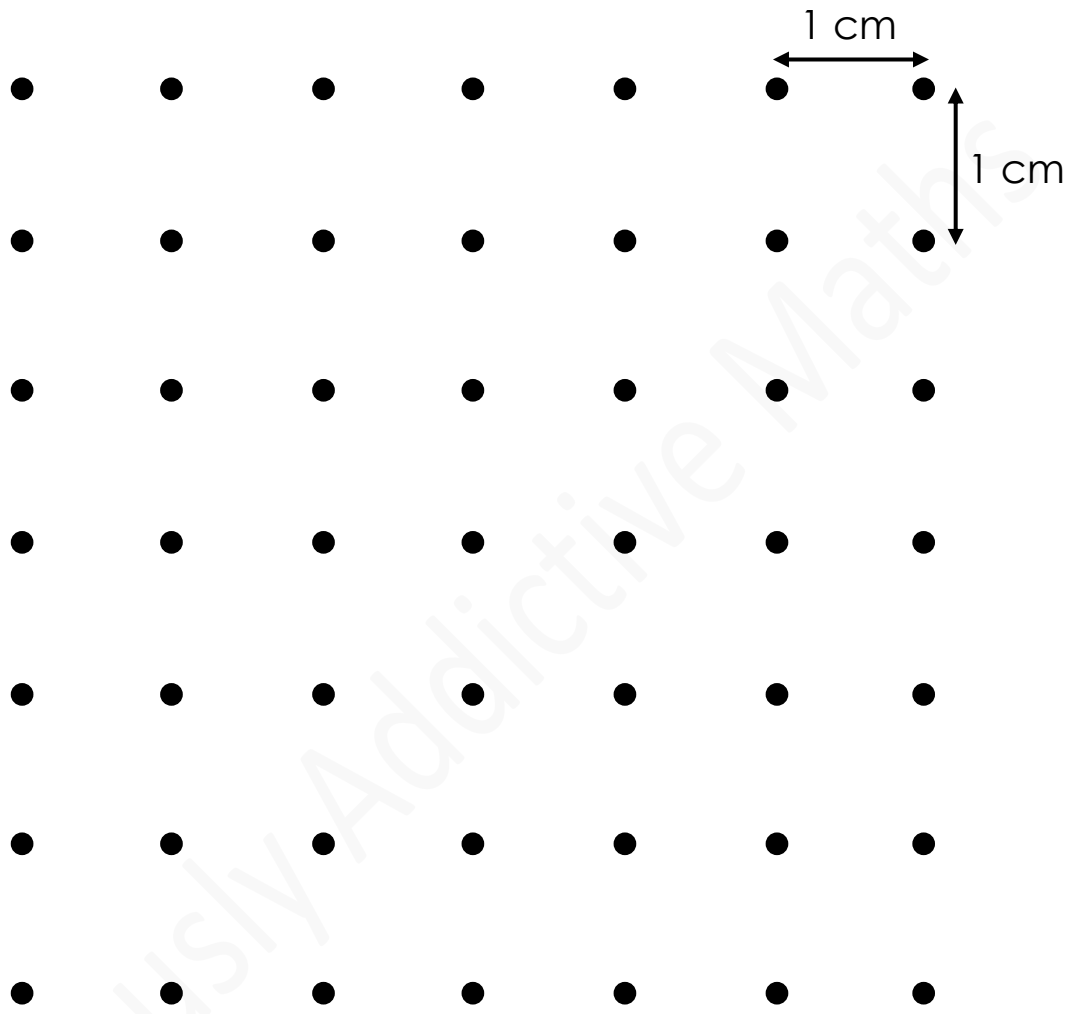
(D) 8 (E) None of the above

8. Ella had some beads. $\frac{1}{4}$ of them were black and the rest were white. She gave 60 beads to Lily. $\frac{2}{3}$ of her remaining beads were black. How many beads did she have left?

(A) 36 (B) 60 (C) 84

(D) 144 (E) None of the above

9. Find the area of the largest possible square that can be drawn on the dot grid such that no more than 2 dots lie on a side of the square.



(A) 16 cm^2 (B) 25 cm^2 (C) 26 cm^2

(D) 36 cm^2 (E) None of the above

10. Alice, Betty, Cheryl, Daisy and Ella competed in a race. Each of them made two statements as shown below.

Alice:	Daisy finished 2nd. Ella finished 3rd.
Betty:	Alice finished 5th. Cheryl finished 1st.
Cheryl:	Daisy finished 4th. Ella finished 2nd.
Daisy:	Betty finished 1st. Cheryl finished 3rd.
Ella:	Alice finished 2nd. Betty finished 1st.

Each girl was right about only 1 statement she has made. Who finished 2nd in the race?

(A) Alice (B) Betty (C) Cheryl

(D) Daisy (E) Ella

Section B

Questions 11 and 12 carry 6 marks each.

11. In the following puzzle, each letter represents a different digit.

$$\begin{array}{cccc} & M & A & T & H \\ \times & & & & 4 \\ \hline & H & T & A & M \end{array}$$

What 4-digit number does MATH represent?

12. Ali has between 70 and 100 cookies. He divides all the cookies equally into 3 jars and he has 1 cookie remaining.

    He then divides all the cookies in one of the jars into 3 equal packets. 1 cookie remains in the jar.

    He then divides all the cookies in one of the packets onto 3 equal plates. 1 cookie remains in the packet.

    How many cookies does he have?