# International Kangaroo Mathematics Contest 2010

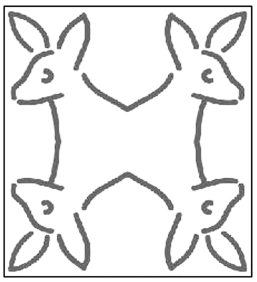
**Cadet Level: Class (7 & 8)** **Max Time: 2 Hours**

## 3-point *problems*

**Q1)** How much is 12 + 23 + 34 + 45 + 56 + 67 + 78 + 89?

A) 396 B) 404 C) 405 D) other answer.

**Q2)** How many axes of symmetry does the figure have?

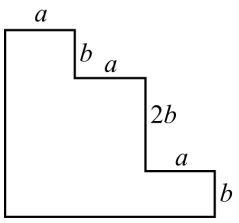


A) 1 B) 2 C) 4 D) infinitely many

**Q3)** Toy kangaroos are packed for shipment. Each of them is packed in a box which is a cube. Exactly eight boxes are packed tightly in a bigger cubic cardboard box. How many kangaroo boxes are on the bottom floor of this big cube?

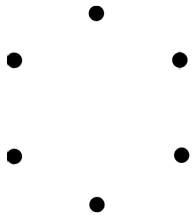
A) 1 B) 2 C) 3 D) 4

**Q4)** The perimeter of the figure is equal to




A) $3a + 4b$ B) $3a + 8b$ C) $6a + 6b$ D) $6a + 8b$

**Q5)** Ehsan draws the six vertices of a regular hexagon and then connects some of the 6 points with lines to obtain a geometric figure. Then this figure is surely not a



A) trapezium B) right angled triangle C) square
D) obtuse angled triangle

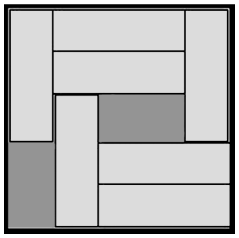
**Q6)** If we type seven consecutive integer numbers and the sum of the smallest three numbers is 33, which is the sum of the largest three numbers?

A) 39 B) 42 C) 48 D) 45

**Q7)** After stocking up firewood, the worker summed up that from the certain number of logs he made 72 logs besides 53 cuts were made. He saws only one log at a time. How many logs were at the beginning?

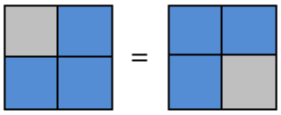
A) 18 B) 19 C) 20 D) 21

**Q8)** There are seven bars in the box. They are 3 cm × 1 cm in size. The box is of size 5 cm × 5 cm. Is it possible to slide the bars in the box so there will be room for one more bar? At least how many bars must be moved in that case?



A) 2 B) 3 C) 4 D) It is impossible

**Q9)** A square is divided into 4 smaller equal-sized squares. All the smaller squares are coloured either green or blue. How many different ways are there to colour the given square? (Two colourings are considered the same if one can be rotated to give the other.)



A) 5 B) 6 C) 7 D) 8

**Q10)** The sum of the first hundred positive odd integers subtracted from sum of the first hundred positive even integers is

A) 0 B) 50 C) 100 D) 10100

## 4-point *problems*

**Q11)** Grandma baked a cake for her grandchildren who will visit in the afternoon. Unfortunately she forgot whether only 3, 5 or all 6 of her grandchildren will come over. She wants to ensure that every child gets the same amount of cake. Then, to be prepared for all three possibilities she better cut the cake into

A) 12 pieces B) 15 pieces C) 18 pieces D) 30 pieces

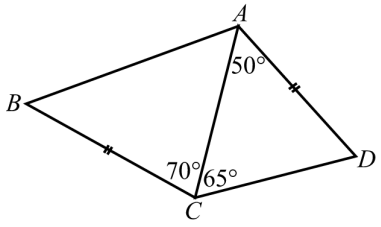
**Q12)** Which of the following is the smallest two-digit number that is not the sum of three different one-digit numbers?

A) 10 B) 15 C) 23 D) 25

**Q13)** Fatima needs 18 min to make a long chain by connecting three short chains with extra chain links. How long does it take her to make a really long chain by connecting six short chains in the same way?

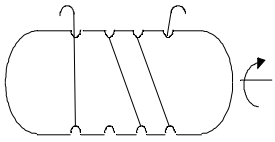
A) 27 min B) 30 min C) 36 min D) 45 min

**Q14)** In quadrilateral $ABCD$ we have $AD = BC$, $\angle DAC = 50^\circ$, $\angle DCA = 65^\circ$, $\angle ACB = 70^\circ$ (see the fig.). Find the value of $\angle ABC$.



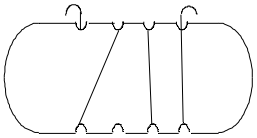

A) 55º B) 60º C) 65º D) impossible to determine.

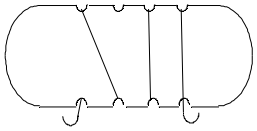
**Q15)** Saima has wound some rope around a piece of wood. She rotates the wood as shown with the arrow.

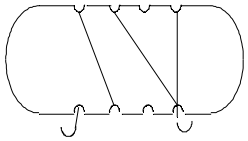


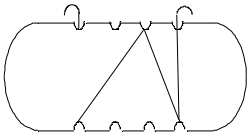
Front side

What does she see after the rotation?

A) 

B) 

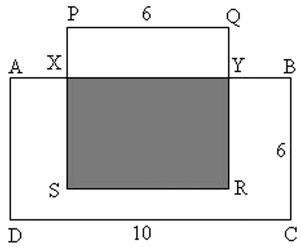
C) 

D) 

**Q16)** There are 50 bricks of white, blue and red colour in the box. The number of white bricks is eleven times the number of blue ones. There are fewer red ones than white ones, but more red ones than blue ones. How many fewer red bricks are there than white ones?

A) 2 B) 11 C) 19 D) 22

**Q17)** On the picture *ABCD* is a rectangle, *PQRS* is a square. The shaded area is half of the area of rectangle *ABCD*. What is the length of *PX*?




A) 1 B) 1.5 C) 2 D) 4

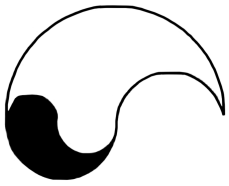
**Q18)** What is the smallest number of straight lines needed to divide the plane into exactly 5 regions?

A) 3 B) 4 C) 5 D) another answer

**Q19)** If $a - 1 = b + 2 = c - 3 = d + 4 = e - 5$, then which of the numbers $a, b, c, d, e$ is the largest?

A) $a$ B) $c$ C) $d$ D) $e$

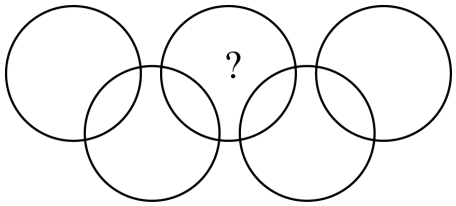
**Q20)** The logo shown is made entirely from semicircular arcs of radius 2 cm, 4 cm or 8 cm. What fraction of the logo is shaded?



A) $\frac{1}{3}$ B) $\frac{1}{4}$ C) $\frac{1}{5}$ D) $\frac{3}{4}$

## 5-point *problems*

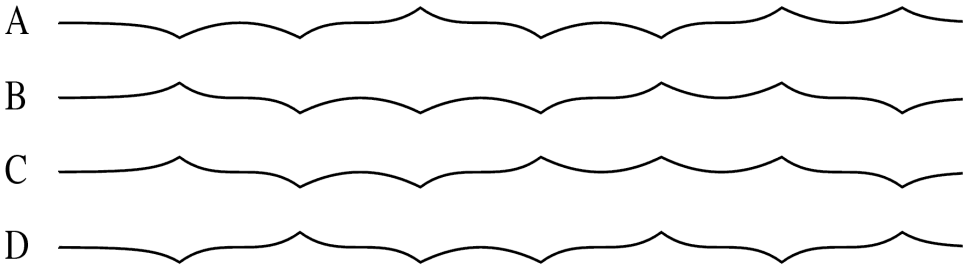
**Q21)** In the figure there are nine regions inside the circles. Put all the numbers from 1 to 9 exactly one in each region so that the sum of the numbers inside each circle is 11.




Which number must be written in the region with the question mark?

A) 5 B) 6 C) 7 D) 8

**Q22)** A paper strip was folded three times in half and then completely unfolded so that you can still see the 7 folds going up or down. Which of the following views from the side cannot be obtained in this way?




**Q23)** On each of 18 cards exactly one number is written, either 4 or 5. The sum of all numbers on the cards is divisible by 17. On how many cards is the number 4 written?

A) 4 B) 5 C) 6 D) 7

**Q24)** The natural numbers from 1 to 10 are written on the blackboard. The students in the class play the following game: a student deletes 2 of the numbers and instead of them writes on the blackboard their sum decreased by 1; after that another student deletes 2 of the numbers and instead of them writes on the blackboard their sum decreased by 1; and so on. The game continues until only one number remains on the blackboard. The last number is:

A) less than 11 B) 11 C) 46 D) greater than 46

**Q25)** A Kangaroo has a large collection of small cubes $1 \times 1 \times 1$. Each cube is a single colour. Kangaroo wants to use 27 small cubes to make a $3 \times 3 \times 3$ cube so that any two cubes with at least one common vertex are of different colours. At least how many colours have to be used?

A) 6 B) 8 C) 9 D) 12