









# Cadet

## 3-Point-Problems

1. There are eight kangaroos in the cells of the table (see the figure on the right). Any kangaroo can jump into any free cell. Find the least number of the kangaroos which have to jump into another cell so that exactly two kangaroos remain in any row and in any column of the table.

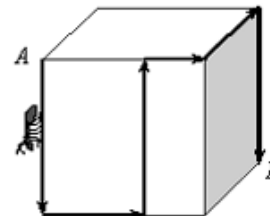
			
			
			
			

- (A) 1      (B) 2      (C) 3      (D) 4

2. How many hours are there in half of a third of a quarter of a day?

- (A)  $\frac{1}{3}$       (B)  $\frac{1}{2}$       (C) 1      (D) 2

3. We have a cube with edge 12 cm. The ant moves on the cube surface from point A to point B along the trajectory shown in the figure. Find the length of ant's path.



- (A) 48 cm      (B) 54 cm  
(C) 60 cm      (D) it is impossible to determine

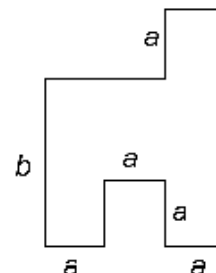
4. At National School, 50% of the students have bicycles. Of the students who have bicycles, 30% have black bicycles. What percent of students of National School have black bicycles ?

- (A) 15%      (B) 20%      (C) 25%      (D) 40%

5. In triangle ABC, the angle at A is three times the size of that at B and half the size of the angle at C. What is the angle at A?

- (A)  $30^\circ$       (B)  $36^\circ$       (C)  $54^\circ$       (D)  $60^\circ$

6. The diagram shows the ground plan of a room. The adjacent walls are perpendicular to each other. Letters a, b represent the dimensions (lengths) of the room. What is the area of the room?



- (A)  $2ab + a(b - a)$       (B)  $3a(a + b) - a^2$   
(C)  $3a(b - a) + a^2$       (D)  $3ab$

7. Nida cuts a sheet of paper into 10 pieces. Then she took one piece and cut it again to 10 pieces. She went on cutting in the same way three more times. How many pieces of paper did she have after the last cutting?

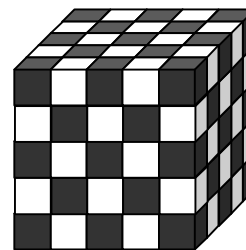
- (A) 36      (B) 40      (C) 46      (D) 50

8. Some crows are sitting on a number of poles in the back of the garden, one crow on each pole. For one crow there is unfortunately no pole. Sometime later the same crows are sitting in pairs on the poles. Now there is one pole without a crow. How many poles are there in the back of the garden?

- (A) 2      (B) 3      (C) 4      (D) 5

9. A cube with the side 5 consists of black and white unit cubes, so that any two adjacent (by faces) unit cubes have different color, the corner cubes being black. How many white unit cubes are used?

- (A) 62      (B) 63      (C) 64      (D) 65



10. To make concrete, mix 4 shovels of stone, 2 shovels of sand and 1 shovel of cement. The number of shovels of stone required to make 350 shovels of concrete is:

- (A) 200      (B) 150      (C) 100      (D) 50

#### 4-Point-Problems

11. Edward has 2004 marbles. Half of them are blue, one quarter are red, and one sixth are green. How many marbles are of some other colour?

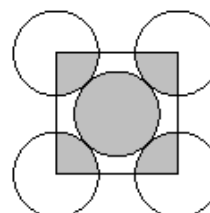
- (A) 167      (B) 334      (C) 501      (D) 1002

12. A group of friends is planning a trip. If each of them would make a contribution of Rs.14 for the expected travel expenses, they would be Rs.4 short. But if each of them would make a contribution of Rs.16, they would have Rs.6 more than they need. How much should each of the friends contribute so that they collect exactly the amount needed for the trip?

- (A) Rs.14.40   (B) Rs.14.60   (C) Rs.14.80   (D) Rs.15.20

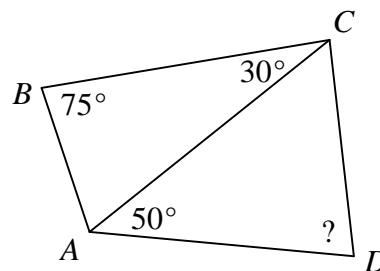
13. In the diagram, the five circles have the same radii and touch as shown. The small square joins the centres of the four outer circles. The ratio of the area of the shaded part of all five circles to the area of the unshaded parts of all five circles is

- (A) 1 : 1      (B) 2 : 5      (C) 2 : 3      (D) 5 : 4



14. Some angles in quadrilateral  $ABCD$  are shown in the figure. If  $BC = AD$ , then what is the angle  $ADC$ ?

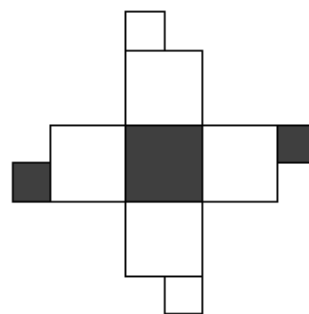
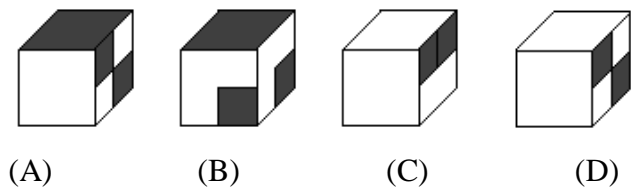
- (A)  $75^\circ$       (B)  $50^\circ$       (C)  $55^\circ$       (D)  $65^\circ$



15. The watchman works 4 days a week and has a rest on the fifth day. He had been resting on Sunday and began working on Monday. After how many days will his rest fall on Sunday?

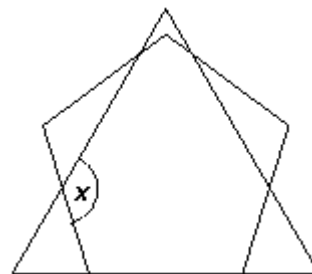
- (A) 31      (B) 12      (C) 34      (D) 7

16. Which of the following cubes has been folded from the plan on the right?



17. The diagram shows an equilateral triangle and a regular pentagon. What, in degrees, is the size of the angle marked  $x$ ?

- (A)  $108^\circ$       (B)  $120^\circ$       (C)  $132^\circ$       (D)  $136^\circ$



18. This is a products table. What two letters represents the same number?

$\times$				7
	J	K	L	56
	M	36	8	N
	O	27	6	P
6	18	R	S	42

- (A) L and M      (B) O and N      (C) R and P      (D) M and S

19. Mike chose a three-digit number and a two-digit number. Find the sum of these numbers if their difference equals 989.

- (A) 1000      (B) 1001      (C) 1009      (D) 1010

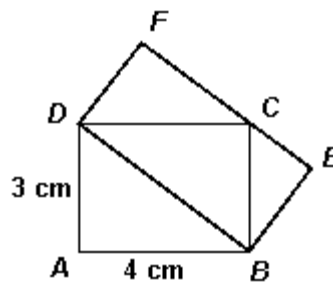
20. Point  $A$  lays on a circle with a center in point  $O$ . What a part of the circle filled the points, which are closer to  $O$ , than to  $A$ ?

- (A)  $3/4$       (B)  $2/3$       (C)  $1/2$       (D)  $5/6$

5-Point-Problems

21. Two rectangles  $ABCD$  and  $DBEF$  are shown in the figure. What is the area of the rectangle  $DBEF$ ?

- (A)  $10 \text{ cm}^2$       (B)  $12 \text{ cm}^2$       (C)  $14 \text{ cm}^2$       (D)  $16 \text{ cm}^2$



22. For a natural number  $N$ , by its length we mean the number of factors in the representation of  $N$  as a product of prime numbers. For example, the length of the number 90 (when  $N=90$ ) is 4 because  $90 = 2 \cdot 3 \cdot 3 \cdot 5$ . How many odd numbers less than 100 have length 3?

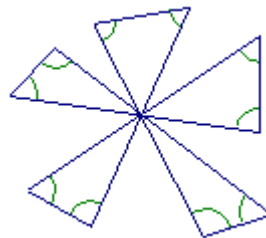
- (A) 3      (B) 5      (C) 7      (D) non of these

23. A caterpillar starts from his home at 9:00 a.m. and move directly on a ground, turning after each hour at  $90^\circ$  to the left or to the right. In the first hour he moved 1 m, in the second hour 2 m, and so on. At what minimum distance from his home the caterpillar would be at 4:00 p.m. in the afternoon?

- (A) 0 m      (B) 1 m      (C) 1.5 m      (D) 2.5 m

24. How many degrees are the sum of the 10 angles which you can see in the picture

- (A)  $300^\circ$       (B)  $360^\circ$       (C)  $600^\circ$       (D)  $720^\circ$



25. The average of 10 different positive integers is 10. How much can be the biggest one among the 10 numbers at most?

- (A) 10      (B) 14      (C) 55      (D) 60