International Kangaroo Mathematics Contest 2008

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

3-point problems

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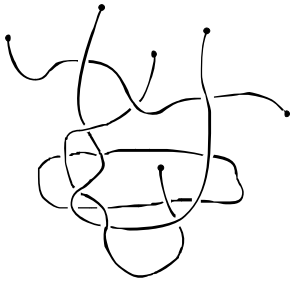
1)

How many pieces of string are there in the picture?



A) 3 B) 4 C) 5 D) 6

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2)

In a class there are 9 boys and 13 girls. Half of the children in this class have got a cold. How many girls at least have a cold?

A) 0 B) 1 C) 2 D) 3

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3)

6 kangaroos eat 6 sacks of grass in 6 minutes. How many kangaroos will eat 100 sacks of grass in 100 minutes?

A) 100 B) 60 C) 6 D) 600

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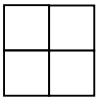
4)

Numbers 2, 3, 4 and one more number are written in the cells of 2 × 2 table. It is known that the sums of the numbers in the first row are equal to 9, and the sum of the numbers in the second row is equal to 6. The unknown number is



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

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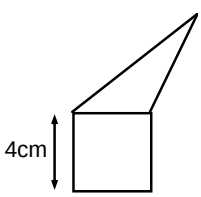
5)



The triangle and the square have the same perimeter. What is the perimeter of the whole figure (a pentagon)?

A) 24 cm B) 28 cm C) 32 cm
D) It depends upon the triangle measures

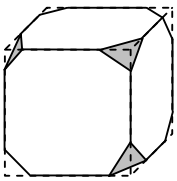
6)

A florist had 24 white, 42 red and 36 yellow roses left. At most, how many identical bunches can she make, if she wants to use all the remaining flowers?

A) 4 B) 6 C) 8 D) 12

7)

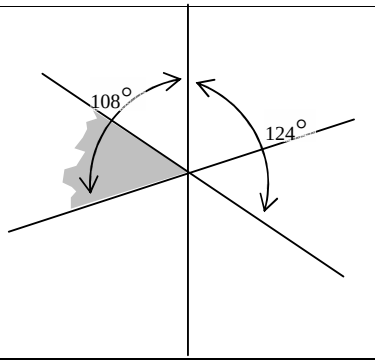
A cube has all its corners cut off, as shown. How many edges does the resulting shape have?



A) 30 B) 36 C) 40
D) Another answer

8)

Three lines intersect in one point. Two angles are given in the figure.
How many degrees is the grey angle?



A) 52 B) 53 C) 54
D) 56

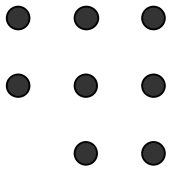
9)

Ali has 9 coins (each is worth 2 cents); while his sister Saima has 8 coins, each being 5 cents. What the least number of coins they should interchange (with each other) in order to equalize their money?

A) 4 B) 5 C) 12 D) it is impossible to do

10)

How many squares can be drawn by joining the dots with line segments?



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

4-point problems

11)

If there are two buses on the circular bus route, the interval between them is 25 min. How many extra buses are necessary to shorten the interval by 60%?

A) 2 B) 3 C) 5 D) 6

12)

The French mathematician August de Morgan claimed that he was x years old in the year of x^2. He is known to have died in 1899. When was he born?

A) 1806 B) 1848 C) 1849 D) another answer

13)

We decide to visit by ferry-boat four islands A,B,C & D starting from the mainland. B can be reached only from A or from the mainland, A & C are connected to each other and with the mainland and D is connected only with A. Which is the minimum number of ferry runs that we need, if we want to visit all the islands?

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

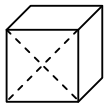
14)

Tom and Jerry cut two equal rectangles. Tom got two rectangles with the perimeter of 40 cm each, and Jerry got two rectangles with the perimeter of 50 cm each. What were the perimeters of the initial rectangles?

A) 40 cm B) 50 cm C) 60 cm D) 80 cm

15)

One of the cube faces is cut along its diagonals (see the fig.). Which of the following net is impossible?



A) **1** and **3** B) **1** and **5** C) **3** and **4** D) **3** and **5**

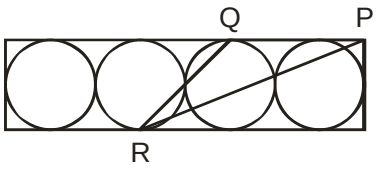
16)

Points *A*, *B*, *C* and *D* are marked on the straight line in some order. It is known that *AB* = 13, *BC* = 11, *CD* = 14 and *DA* = 12. What is the distance between the farthest two points?

A) 14 B) 38 C) 25 D) another answer

17)

Four tangent congruent circles of radius 6 cm are inscribed in a rectangle. If P is a vertex and Q and R are points of tangency, what is the area of triangle PQR?



A) 27 cm^2 B) 45 cm^2 C) 54 cm^2
D) 108 cm^2

18)

Seven cards lie in a box. Numbers from 1 to 7 are written on these cards (exactly one number on the card). The first sage takes, at random, 3 cards from the box and the second sage takes 2 cards (2 cards are left in the box). Then the first sage tells to the second one: “I know that the sum of the numbers of your cards is even”. The sum of card’s numbers of the first sage is equal to

A) 10 B) 12 C) 9 D) 15

19)

In an isosceles triangle *ABC*, the bisector *CD* of the angle *C* is equal to the base *BC*. Then the angle *CDA* is equal to

A) 100º B) 108º C) 120º D) impossible to determine

20)

A wooden cube 11 x 11 x 11 is obtained by sticking together 11^3 unit cubes. What is the largest number of unit cubes visible from a same point of view?

A) 329 B) 330 C) 331 D) 332

5-point problems

21)

In the equality KAN – GAR = OO any letter stands for some digit (different letters for different digits, equal letters for equal digits). Find the largest possible value of the number KAN ?

A) 876 B) 865 C) 864 D) 785

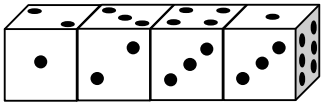
22)

A boy always speaks the truth on Thursday and Fridays, always tells lies on Tuesdays, and randomly tells the truth or lies on other days of the week. On seven consecutive days he was asked what his name was, and on the first six days he gave the following answers in order: Akbar, Ali, Akbar, Ali, Farooq, Ali. What did he answer on the seventh day?

A) Akbar B) Ali C) Amir D) another answer

23)

Four identical dice are arranged in a row (see the fig.). The dice are not standard, i.e., the sum of points in the opposite faces of the dice not necessarily equals 7. Find the total sum of the points in all 6 touching faces of the dice.



A) 19 B) 20 C) 21 D) 22

24)

Some straight lines are drawn on the plane so that all angles 10°**,** 20°**,** 30°, 40°, 50°, 60°, 70°, 80°, 90° are among the angles between these lines. Determine the smallest possible number of these straight lines.

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

25)

On my first spelling test, I score one mark out of five. If I now work hard and get full marks on every test, who many more tests should I take for my average to be four out of five correct answers?

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

GOOD LUCK !