3 point questions:

1. Anh, Ben and Chen have 30 balls between them. If Ben gives 5 to Chen, Chen gives 4 to Anh and Anh gives 2 to Ben, then the boys will each have the same number of balls. How many balls did Anh start with?

A) 8 B) 9 C) 11 D) 13 E) 15

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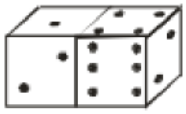
2. What is the sum of the spots on all unshown faces of the dice?



A) 15 B) 12 C) 7 D) 27 E) another answer

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3. When announcing the results of a tombola (raffle), the moderator said: "The winning tickets are those which contain at least 5 digits, such that at most three of their digits are larger than 2. Subsequently, the speaker drew tickets with numbers 1022, 22222, 102334, 213343, 3042531. How many of them were winning ones?

A) 1 B) 2 C) 3 D) 4 E) 5

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4. In triangle ABC, D is the midpoint of AB, E is the midpoint of DB, F is the midpoint of BC. If area of triangle ABC is 96, then the area of the triangle AEF is

A) 16 B) 24 C) 32 D) 36 E) 48

---

5. Frida has divided her 2007 marbles in three bags A, B and C in such a way that each bag contains exactly the same number of marbles. If Frida moves $2/3$ of the marbles from bag A to bag C, then the ratio between the number of marbles in bag A and C will be

A) 1:2 B) 1:3 C) 2:3 D) 1:5 E) 3:2

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6. An international organization has 32 members. How many members will it have in three years time, if the number of members increases each year compared to the previous one by 50%?

A) 182 B) 128 C) 108 D) 96 E) 80

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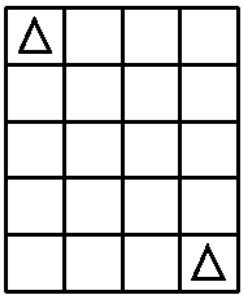
7. How many possible routes with the minimum number of moves are there for the king to travel from the top left square to the bottom right square of the grid (the king can move to any adjacent square, including diagonally).



A) 1 B) 4 C) 7 D) 20 E) 35

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8. To complete the table each cell must contain either a zero or a one. The sum of each column, and each row, must be two. What are the values of X and Y ?

1		1	
		1	
	X		0
	Y		

A) X=1, Y=1 B) X=1, Y=0 C) X=0, Y=1 D) X=0, Y=0 E) It is impossible to complete.

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9. Different letters represent different digits. Find the least possible value of the expression 2007 — KAN — GA — ROO.

A) 100 B)110 C)112 D)119 E)129

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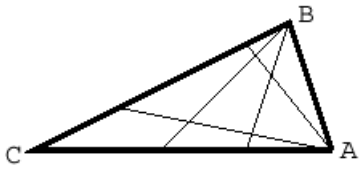
10. The diagram on the right shows a triangle ABC where two lines are drawn to the opposite sides from each of two vertices. This divides the triangle into nine non-overlapping sections. If eight lines are drawn to the opposite sides, four from A and four from B, what is the number of non-overlapping sections into which the triangle is divided ?



A) 16 B) 25 C) 36 D) 42 E) 49

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4 point questions:

11. An island is inhabited by liars and nobles (the liars always tell lies and the nobles always tell the truth).One day 12 islanders, both liars and nobles, gathered together and issued a few statements. Two people said: “Exactly two people among us twelve are liars ”.The other four people said: “Exactly four people among us twelve are liars ”.The remaining six people said:“ Exactly six people among us twelve are liars ”. How many liars were there?

A) 2 B) 4 C) 6 D) 8 E) 10

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12. In order to obtain the number 8^8, we must raise 4^4 to the power

A) 2 B) 3 C) 4 D) 8 E) 16

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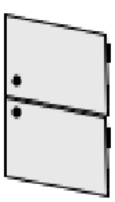
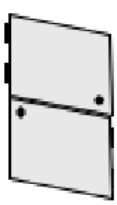
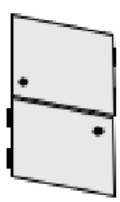
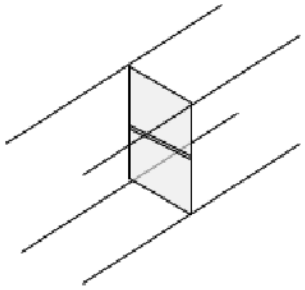
13. A corridor is sagged on the right side. As a consequence the profile is not a rectangle, but a parallelogram. Halfway along the corridor one makes a door. The door has two halves, which can open separately. Where should one put the hinges?

A) both left B) both right C) above left, below right D) below left, above right E) the door can never be opened properly

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14. The students were solving an interesting problem at the "Kangaroo ".As a result the number of the boys who had solved the problem turned out to be the same as the number of the girls who hadn't solved the problem. Which are there more of: those who had solved the problem or the girls?

A) girls
B) those who have solved the problem
C) equal
D) impossible to determine
E) the situation is not possible

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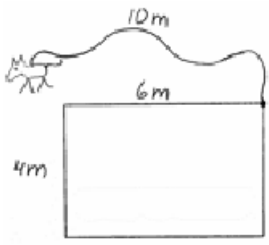
15. A 10 m long rope is fastened to the corner of the house. A dog is fastened to the rope. Find the *perimeter* of the area, where the dog can be found.



A) 20π B) 22π C) 40π D) 88π E) 100π

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16. It is 21:00 hours and I 'm driving with velocity 100 km/h. With this velocity I have enough petrol for a distance of 80 km. The nearest petrol pump is 100 km away. The amount of petrol my car uses per km is proportional to the velocity of the car.
What is the earliest time that I can arrive at the petrol pump?

A) 22:12 B) 22:15 C) 22:20 D) 22:25 E) 22:30

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17. A trapezium is formed by removing a corner of an equilateral triangle. Then two copies of this trapezium are placed side by side to form a parallelogram. The perimeter of the parallelogram is 10cm longer than the perimeter of the original triangle. What was the perimeter of the original triangle?

A) 10 cm B) 30 cm C) 40 cm D) 60 cm E) more information needed

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18. A sequence of letters KANGAROOKANGAROO...KANGAROO contains 20 words KANGAROO. First, all the letters in the odd places of the sequence were erased. Then, in the sequence obtained, once more all the letters in the odd places were erased, and so on. At the very end, only one letter remained. This Letter is

A) K B) A C) N D) G E) O

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19. Two schools play each other at table tennis. There are five students from each school. Every game is a doubles game, and every possible pair from one school will play one game against every possible pair from the other school. How many games will each of the ten students play?

A) 10 matches B) 20 matches C) 30 matches D) 40 matches E) 50 matches

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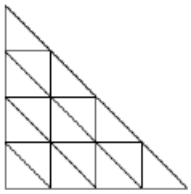
20. How many different ways can you go from the upper point of the hypotenuse to the lowest point if you can go only down, right or down by a hypotenuse?



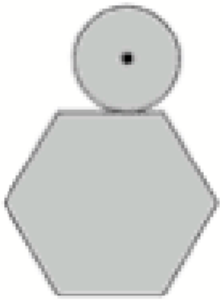
A) 16 B) 27 C) 64 D) 90 E) 111

5 point questions:

21. In a village there are no two people with the same number of hairs. Nobody has exactly 2007 hairs. Joe has the most number of hairs in the village. The number of villagers is more than the number of Joe 's hairs. What is the maximum number of villagers?

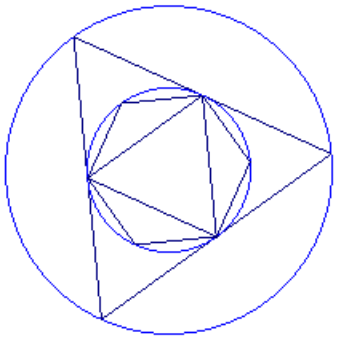
A) 1 B) 2006 C) 2007 D) 2008 E) 2009

22. A coin with diameter 1 cm rolls around the outside of a regular hexagon with edge length 1 cm, as shown. In centimetres, what is the length of the path traced out by the centre of the coin?



A) $6+\frac{\pi}{2}$ B) $6+\pi$ C) $12+\pi$ D) $6+2\pi$ E) $12+2\pi$

23. An equilateral triangle and a regular hexagon are inscribed in a circle, inscribed itself in an equilateral triangle (see the figure). S_1 is the area of the big triangle, S_2 the area of the little triangle and S_3 the area of the hexagon. Which of the statements below is true?



A) $S_3 = \sqrt{S_1 \cdot S_2}$ B) $S_3 = \frac{S_1 + S_2}{2}$ C) $S_1 = S_2 + S_3$ D) $S_3 = \sqrt{S_1^2 \cdot S_2^2}$ E) $S_1 = S_3 + 3S_2$

24. Let A be the least number with the following property: 10 ·A is a perfect square and 6 ·A is a perfect cube. How many factors does A have?

A) 30 B) 40 C) 54 D) 72 E) 96

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25. In a safe-deposit there are some necklaces. All the necklaces have the same number of diamonds (at least two diamonds in each necklace).If the number of diamonds in the safe-deposit would be known, then the number of the necklaces would also be known without doubt. The number of diamonds is more than 200 but less than 300. How many necklaces are there in the safe-deposit?

A) 16 B) 17 C) 19 D) 25 E) other answer

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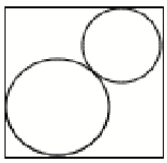
26. Two circles have their centres on the same diagonal of a square. They touch each other and the sides of the square as shown. The square has side length 1cm.What is the sum of the lengths of the radii of the circles in centimeters?



A) $\frac{1}{2}$ B) $\frac{1}{\sqrt{2}}$ C) $\sqrt{2} - 1$ D) $2 - \sqrt{2}$ E) It depends on the relative sizes of the circles

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27. In a box there are three cards for each of the following colors: red, green, yellow and blue. For each color, the three cards are numbered 1,2 and 3.You take randomly three cards from the box. Which of the following events is the most probable one?

A) The three cards are of the same color
B) The three cards, independently of their colors, are numbered 1, 2 and 3
C) The three cards are of three different colors
D) The three cards have the same number
E) None, the four previous events have the same probability

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28. In a party five friends are going to give each other gifts in such a way that everybody gives one gift and receives one (of course, no one should receive his own gift). In how many ways is this possible?

A) 5 B)10 C) 44 D) 50 E) 120

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29. The real solutions of the equation $x^2 - 3x + 1 = 0$ are a and b. What is the value of $a^3 + b^3$?

A) 12 B) 14 C) 16 D) 18 E) 24

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30. The distance between two non-adjacent edges of a regular tetrahedron is 6 cm. What is the volume of the tetrahedron in cm^3?

A) 18 B) 36 C) 48 D) 72 E) 144
