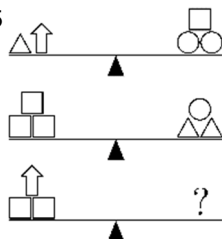23. Nine tokens are black on one side and white on the other. Initially, 4 tokens have the black side upwards: ●●●●○○○○○. In each turn you have to flip 3 tokens. What is the least number of turns you need to have all tokens showing the same colour?
(A) 1   (B) 2   (C) 3   (D) 4   (E) 5

24. Which of the following options balances the third scale for sure?

(A) △△△△□ (B) △△△○
(C) △○○○ (D) △□□□□ (E) ○○□

25. Ten people ordered ice cream, one scoop each: 4 scoops vanilla, 3 scoops chocolate, 2 scoops lemon and 1 scoop mango. The scoops were decorated with 4 umbrellas, 3 cherries, 2 wafers and 1 chocolate chip, one decoration on each scoop, such that no two ice creams were alike. Which of the following combinations was NOT served?
(A) chocolate with a cherry   (B) mango with an umbrella
(C) vanilla with an umbrella   (D) lemon with a wafer
(E) vanilla with a chocolate chip
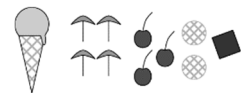
26. We call a 3-digit number "nice" if the middle digit is greater than the sum of its neighbours. What is the largest number of successive "nice" numbers?
(A) 5   (B) 6   (C) 7   (D) 8   (E) 9

27. In a chess tournament, Magnus has 15 games to play. Some time during the tournament he has won half of the games he has played, he has lost one third and two have ended in a draw. How many games has Magnus still to play in the tournament?
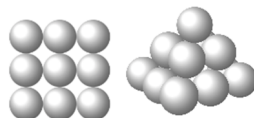(A) 2   (B) 3   (C) 4   (D) 5   (E) 6

28. A piece of paper has the numbers 1 to 8 written on it, as in the picture. We then fold the paper four times, in any order, along the grid lines. Which numbers will face the same direction as the number 1?
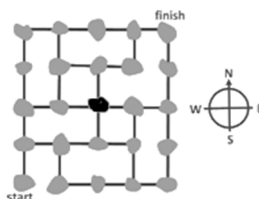
| 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 |

(A) 1, 4, 5, 8   (B) 1, 2, 5, 6   (C) 1, 3, 5, 7
(D) 1, 3, 6, 8   (E) it depends on the folding

29. Don builds a pyramid with balls. The square base consists of 3 x 3 balls. The middle layer has 2 x 2 balls, and there is one ball at the top. There is glue at each contact point between two balls. How many glue points are there?
(A) 20   (B) 24   (C) 28   (D) 32   (E)36

30. The figure shows a map of islands and how they are connected by bridges. A postman has to visit all the islands exactly once. He started at the island marked "start" and would like to end at "finish". He has just reached the black island at the centre of the map. How must he move on his next step?
(A) by going North   (B) by going East
(C) by going South   (D) by going West
(E) there is no such path as the postman wishes to follow

Laiks uzdevumu risināšanai – 75 minūtes!
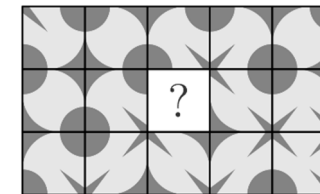
3 point problems

1. Which tile is missing?

(A)   (B)
(C)   (D)   (E)

2. As Amira is walking from town A to town B she passes the five signposts shown. One of them is incorrect. Which one?

(A)   (B)   (C)   (D)   (E)

3. A large square consists of small white and grey squares. What does the large square look like if the colours are interchanged?

(A)   (B)   (C)   (D)   (E)

4. Mikas wants to bake 24 muffins for his birthday party. To bake six muffins two eggs are needed. Eggs are sold in boxes of six. How many boxes does Mikas need to buy?
(A) 1   (B) 2   (C) 3   (D) 4   (E) 8

5. Using these shapes Lisa can make different figures. She does not need to use all the shapes every time. Which of the figures below she can not make?

(A)   (B)   (C)   (D)   (E)

6. Kim has several chains of length 5 and length 7: ●●●●●●●. By joining chains one after the other, Kim can create different lengths. Which of these lengths is impossible to make?
(A) 10   (B) 12   (C) 13   (D) 14   (E) 15

7. Maria has 10 sheets of paper. She cuts some of the sheets into five parts each. After that Maria has 22 pieces in total. How many sheets did she cut?
(A) 3   (B) 2   (C) 6   (D) 7   (E) 8

8. Cindy colours each region on the plate with either red, blue or yellow. She colours neighbouring regions with different colours. She colours the outer ring of the plate blue. How many of the regions will be blue in the end?

(A) 2   (B) 3   (C) 4   (D) 5   (E) 6
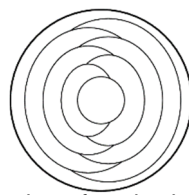
9. Four baskets contain 1, 4, 6 and 9 apples respectively. How many apples do we need to move among the baskets in order to get the same number of apples in each basket?

(A) 3   (B) 4   (C) 5   (D) 6   (E) 7

10. A dog and a cat walk in the park along the path marked by the thick black line. At the same time, the dog starts from P and the cat from Q. If the dog walks three times as fast as the cat, where are they going to meet?
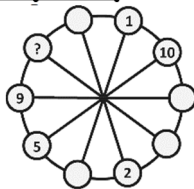
(A) at A   (B) at B
(C) at C   (D) at D   (E) at E
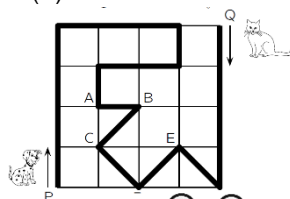
4 point problems

11. The numbers from 1 to 10 have to be placed in the small circles, one in each circle. Numbers in two neighbouring circles must have the same sum as the numbers in the two diametrically opposite circles. Some of the numbers are already placed. What number should be placed in the circle with the question mark?

(A) 3   (B) 4   (C) 6   (D) 7   (E) 8

12. When bat Elyse leaves the cave a digital clock shows 20:20. When Elyse has come back and is hanging upside down she sees 20:20 again. How long has she been hunting outside the cave?

(A) 3 hours, 28 minutes   (B) 3 hours, 40 minutes
(C) 3 hours, 42 minutes   (D) 4 hours, 18 minutes   (E) 5 hours, 42 minutes

13. An elf and a troll meet. The troll always lies, while the elf always tells the truth. They both have just said one of the following sentences: which one?
(A) I am telling the truth   (B) You are telling the truth
(C) We both are telling the truth   (D) I always lie
(E) One and only one of us is telling the truth

14. Mary has exactly 10 white cubes, 9 light grey cubes and 8 dark grey cubes, all of the same size. She glues all these cubes together, to build a big cube. Which of the cubes below can be the one she built?

(A)   (B)   (C)   (D)   (E)
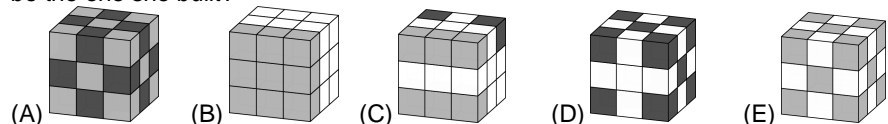
15. There are five paths from X to Y marked with the thick line. Which one is the shortest?

(A)   (B)   (C)   (D)   (E)
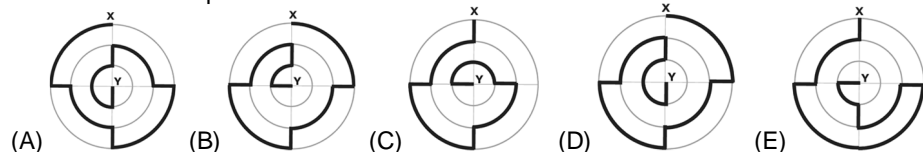
16. A father kangaroo lives with his three children. They decide on all matters by vote, and each member of the family gets as many votes as its age. The father is aged 36 and the children are 13, 6 and 4 years old, so the father always wins. How many years will it take for the children to win all votes, if they all agree?
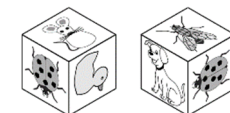
(A) 5   (B) 6   (C) 7   (D) 13   (E) 14

17. Giorgio has two equal pieces of wire of shape ⌐_. Which of the following shapes cannot be obtained putting together these two pieces?
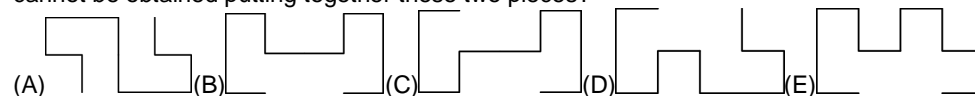
(A)   (B)   (C)   (D)   (E)

18. Amy glues 6 stickers on the sides of a cube: She shows the cube to her friend (see picture). Which sticker is on the face opposite to the mouse?

(A)   (B)   (C)   (D)   (E)

19. The following scheme shows the friendship among Ann, Beatrice, Chloe, Diana, Elisabeth and Fiona. Each number represents one of the girls and each line represents a friendship between two girls. Each of the 3 girls Chloe, Diana and Fiona has four friends. Chloe and Diana are both friends of Beatrice. Beatrice has no other friends. Which number represents Fiona?

(A) 2   (B) 3   (C) 4   (D) 5   (E) 6
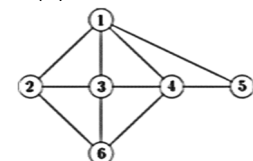
20. Mary put the same amount of liquid in three rectangular vessels. Viewed from the front, they seem to have the same size, but the liquid has risen to different levels in the three vessels. Which of the following images represents the three vessels viewed from above?
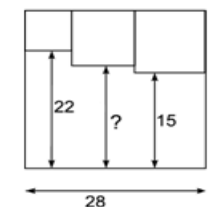
(A) I II III   (B) I II III   (C) I II III   (D) I II III   (E) I II III
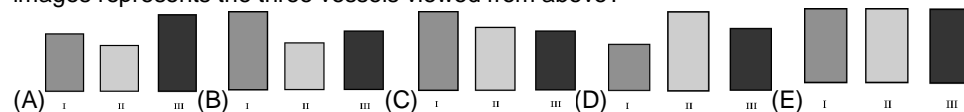
5 point problems

21. What does the object in the picture look like when viewed from above?

(A)   (B)   (C)   (D)   (E)
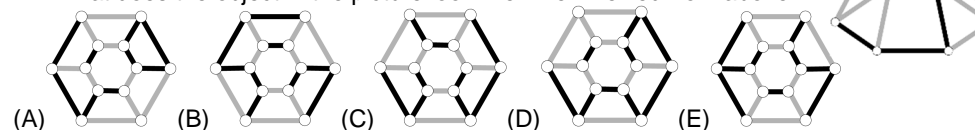
22. Three small squares are drawn inside a big square as shown. What is the length of the segment with the question mark?

(A) 17   (B) 17,5
(C) 18   (D) 18,5   (E) 19