

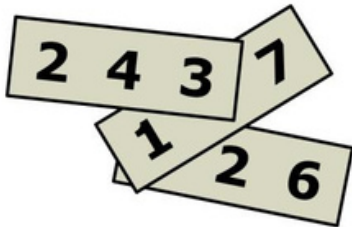
MK Team Level 5-6 Sample

Multiple-choice Questions

1. There are 30 students in a class. They sit by pairs: each boy is sitting with a girl, and exactly half of the girls are sitting with a boy. How many boys are there in the class?

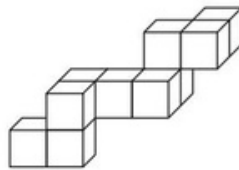
- (A) 25 (B) 20 (C) 15 (D) 10 (E) 5

2. On each of three pieces of paper a three digit number is written. Two of the digits are covered. The sum of the three numbers is 826. What is the sum of the two covered digits?



- (A) 7 (B) 8 (C) 9 (D) 10 (E) 11

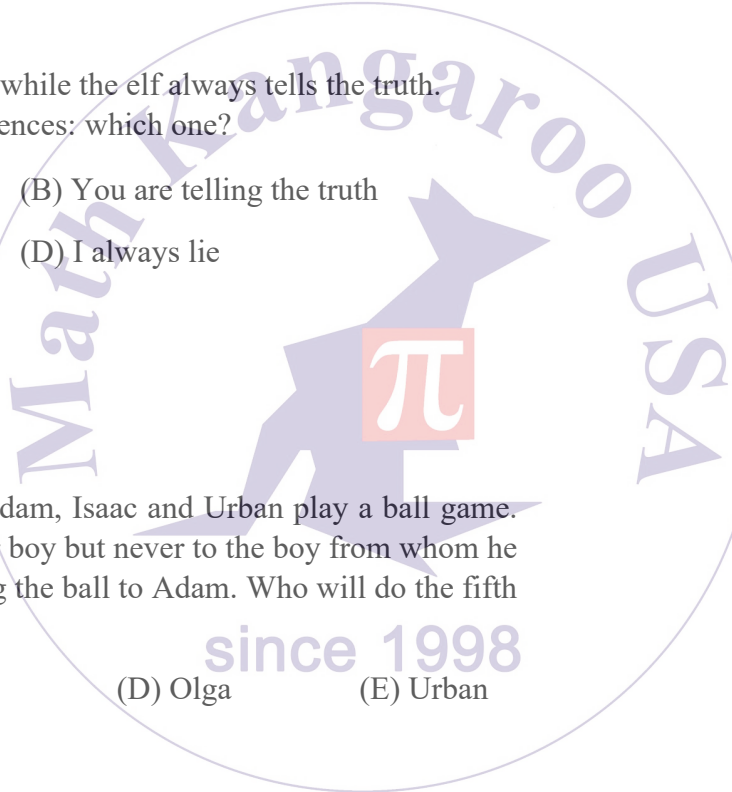
3. Morten builds this shape by gluing together several $1 \times 1 \times 1$ cubes. He wants to pack it in a box. Which box is the smallest that he can use?



- (A) $3 \times 3 \times 4$ (B) $3 \times 5 \times 5$ (C) $3 \times 4 \times 5$ (D) $4 \times 4 \times 4$ (E) $4 \times 4 \times 5$

4. Every day Mary writes down the month and day and calculates the sum of the digits written. For example, on March 19 she writes 19.03 and calculates $1 + 9 + 0 + 3 = 13$. What is the largest sum that she calculates during a year?

- (A) 7 (B) 13 (C) 14 (D) 16 (E) 20



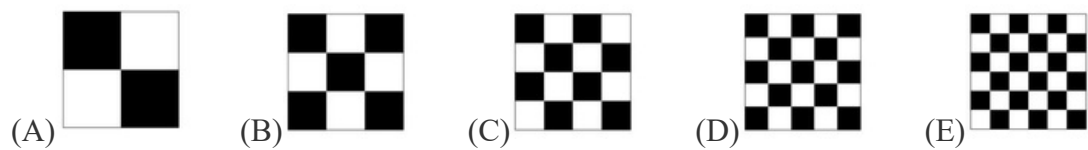
9. An elf and a troll meet. The troll always lies, while the elf always tells the truth. They both say exactly one of the following sentences: which one?

- (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

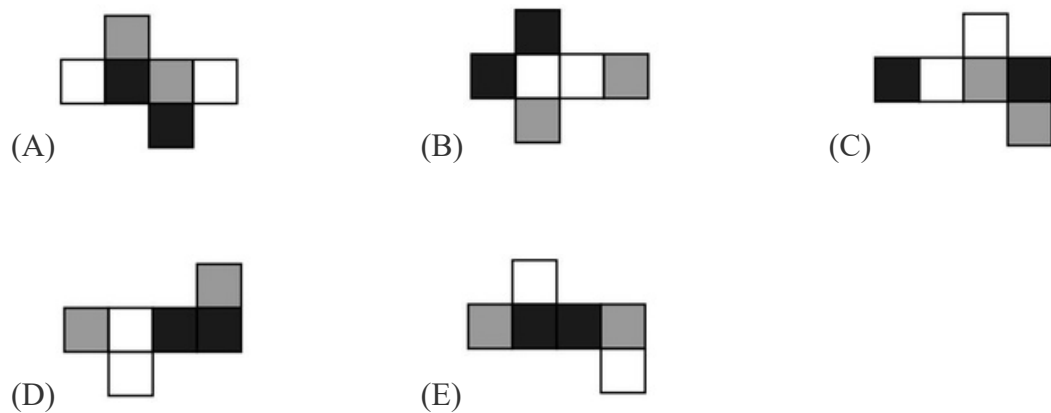
10. Two girls, Eva and Olga and three boys, Adam, Isaac and Urban play a ball game. When a boy has the ball, he throws it to another boy but never to the boy from whom he just received it. Eva starts the game by throwing the ball to Adam. Who will do the fifth throw?

- (A) Adam
- (B) Eva
- (C) Isaac
- (D) Olga
- (E) Urban

11. Five equal squares are divided into smaller squares. Which square has the largest black area?



12. The faces of a cube are painted black, white or grey so that opposite faces are of different colour. Which of the following is NOT a possible net of this cube?



13. John does a calculation using the digits A, B, C and D. Which digit is represented by B?

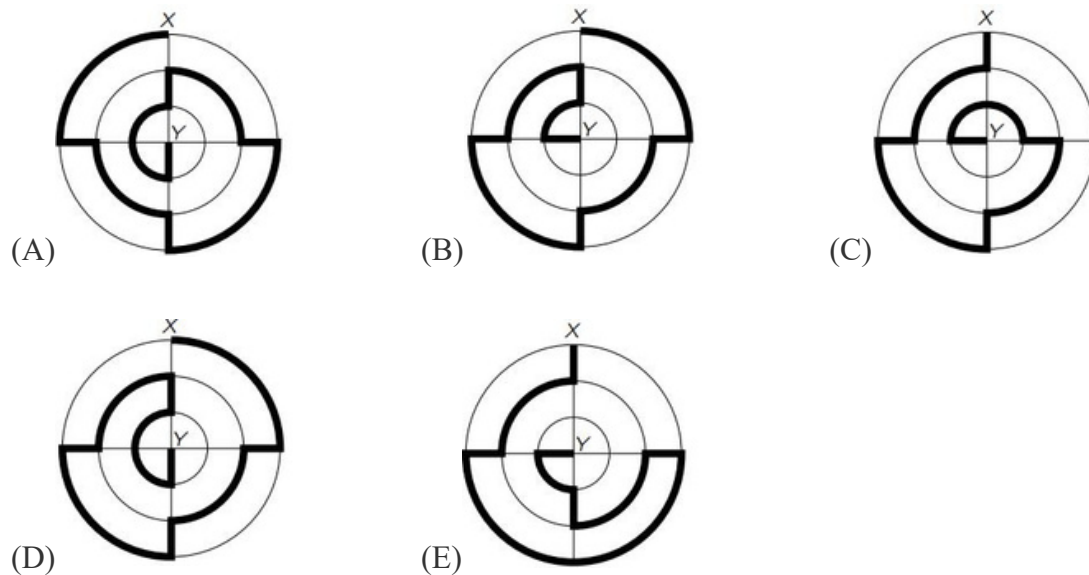
$$\begin{array}{r} ABC \\ + CBA \\ \hline DDD \end{array}$$

- (A) 0 (B) 2 (C) 4 (D) 5 (E) 6

14. Four players scored goals in a handball match. All of them scored a different number of goals. Among the four Mike was the one who scored the least number of goals. The other three have scored 20 goals in total. What is the largest number of goals Mike could have scored?

- (A) 2 (B) 3 (C) 4 (D) 5 (E) 6

15. The diagrams show five paths from X to Y marked with a thick line. Which path is the shortest?



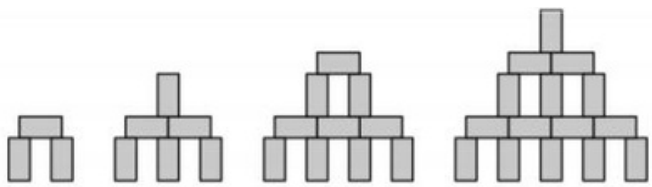
16. The area of a rectangle is 12 cm^2 . The lengths of its sides are whole numbers. Then, the perimeter of this rectangle, in cm, could be:

- (A) 20 (B) 26 (C) 28 (D) 32 (E) 48

17. A father kangaroo lives with his three children. They make all decisions by voting, 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

18. With blocks of dimension $1 \text{ cm} \times 1 \text{ cm} \times 2 \text{ cm}$, you can build towers as shown in the picture. How high is a tower that is built in the same way with 28 blocks?



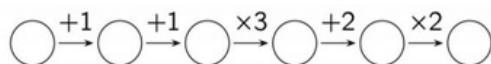
- (A) 9cm (B) 11cm (C) 12cm (D) 14cm (E) 17cm

19. A big cube was built from 8 identical small cubes, some black ones and some white ones. Five faces of the big cube are as follows. What does the sixth face of the big cube look like?



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

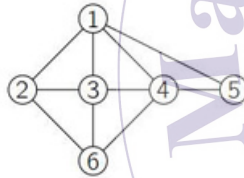
20. Benjamin writes an integer in the first circle and then fills the other five circles by following the instructions. How many of the six numbers in the circles are divisible by 3?



- (A) 1 (B) both 1 and 2 are possible (C) 2
 (D) both 2 and 3 are possible (E) both 3 and 4 are possible

Fill-in-the-blank Questions

21. The diagram below shows the friendships of six girls: Ann, Beatrice, Chloe, Diana, Elisabeth and Fiona. Each number represents one of the girls and each line joining two numbers represents a friendship between those two girls. Chloe, Diana and Fiona each have four friends. Beatrice is friends with only Chloe and Diana. Which number represents Fiona?

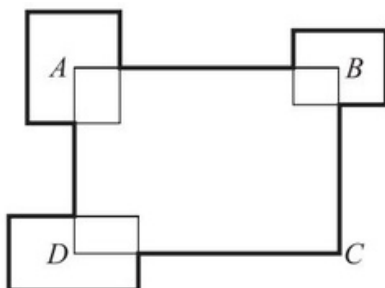


22. The number 100 is multiplied either by 2 or by 3, then the result is increased either by 1 or by 2, and then the new result is divided either by 3 or by 4. The final result is a natural number. What is this final result?

23. Clara wants to construct a big triangle using identical small triangular tiles. She has already put some tiles together as shown in the picture. What is the smallest number of tiles she needs to add to complete a triangle?

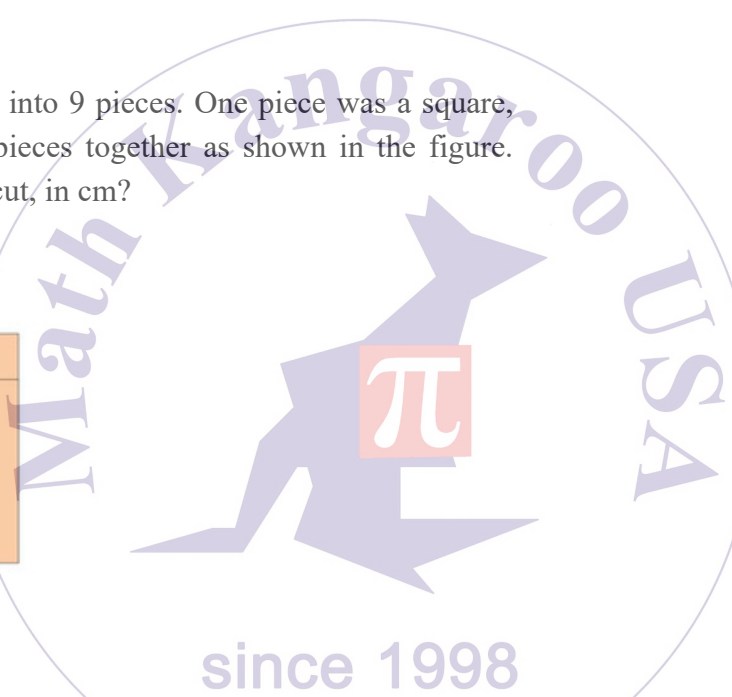
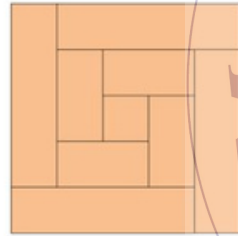


24. The perimeter of the rectangle ABCD is 30 cm. Three other rectangles are placed so that their centers are at the points A, B and D, as in the figure. The sum of the perimeters of these three rectangles (with centers A, B, D) is 20 cm. What is the total length of the thick line?

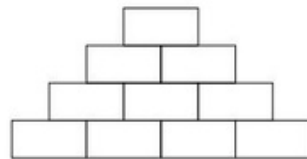


25. A bag contains only red marbles and green marbles. For any 5 marbles we pick, at least one is red. For any 6 marbles we pick, at least one is green. What is the largest number of marbles that the bag can contain?

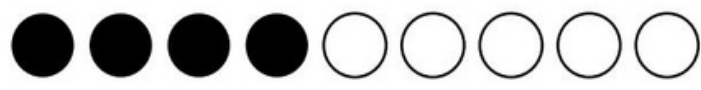
26. Peter cut a wooden board with width 8 cm into 9 pieces. One piece was a square, the rest were rectangles. Then he put all the pieces together as shown in the figure. How long was the wooden board before it was cut, in cm?



27. John wants to write a positive integer in each box such that each number (except those in the bottom row) is equal to the sum of the two numbers in the boxes immediately underneath it. What is the largest number of odd integers that John can write?



28. Nine tokens are black on one side and white on the other. Initially, four tokens have the black side upwards. In each turn you have to flip three tokens. What is the least number of turns you need to have all tokens showing the same colour?



29. Linas builds a $4 \times 4 \times 4$ cube using 32 white and 32 black $1 \times 1 \times 1$ cubes. He arranges the cubes so that as much of the surface of his large cube is white. What fraction of the surface of his cube is white?

30. There are eight domino tiles on the table. Half of one tile is covered. The 8 tiles can be arranged into a 4×4 square, so that the number of dots in each row and each column is the same. How many dots are on the covered part?

