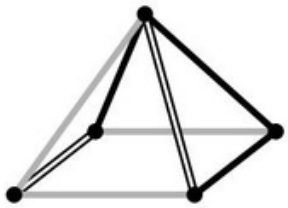
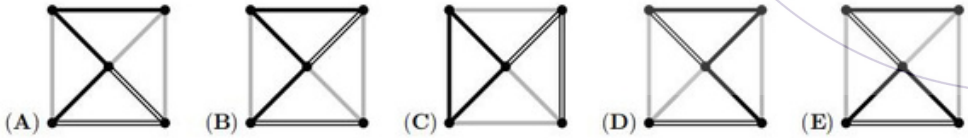
MK Team Level 7-8 Sample

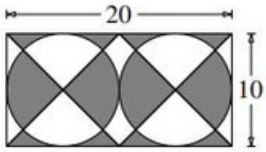
Multiple-choice Questions

1. Which of the following shows the view of the object from above?





2. What is the shaded area?



(A) 50 (B) 80 (C) 100 (D) 120 (E) 150

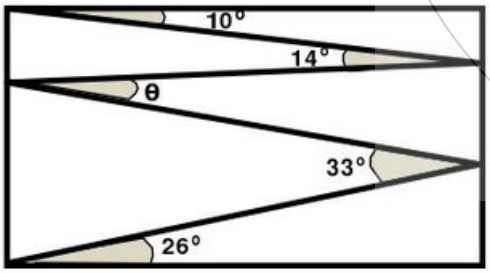
3. A rectangle is divided into 40 identical squares. The rectangle contains more than one row of squares. Andrew found the middle row of squares and coloured it in. How many squares did he not colour?

(A) 20 (B) 30 (C) 32 (D) 35 (E) 39

4. Andrew divided some apples into six equal piles. Boris divided the same number of apples into five equal piles. Boris noticed that each of his piles contains two more apples than each of Andrew's piles. How many apples does Andrew have?

(A) 60 (B) 65 (C) 70 (D) 75 (E) 80

5. Valeriu draws a zig-zag line inside a rectangle, creating angles of 10 , 14 , 33 and 26 as shown below. What is the size of angle θ?



(A) 11 (B) 12 (C) 16 (D) 17 (E) 33

6. Werner's salary is 20% of his boss's salary. By what percentage should Werner's salary increase to become equal to his boss's salary?

(A) 80% (B) 120% (C) 180% (D) 400% (E) 520%

7. Four cousins Ema, Iva, Rita and Lina are 3, 8, 12 and 14 years old, although not necessarily in that order. Ema is younger than Rita. The sum of the ages of Lina and Ema is divisible by 5. The sum of the ages of Lina and Rita is also divisible by 5. How old is Iva?

(A) 14 (B) 12 (C) 8 (D) 5 (E) 3

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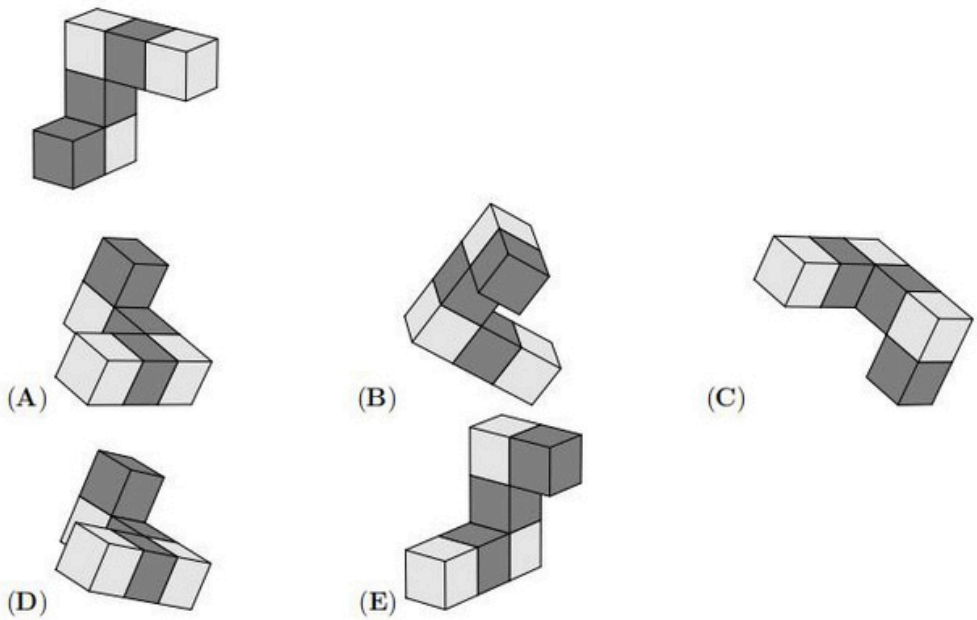
8. In the final round of a music competition, each of the three members of the jury gives the five competitors 0 points, 1 point, 2 points, 3 points or 4 points. No two competitors get the same mark from any individual judge. Adam knows all the sums of the marks and a few single marks, as shown. How many points did Adam get from judge III?

	Adam	Berta	Clara	David	Emil
I	2	0			
II		2	0		
III					
Sum	7	5	3	4	11

(A) 0 (B) 1 (C) 2 (D) 3 (E) 4

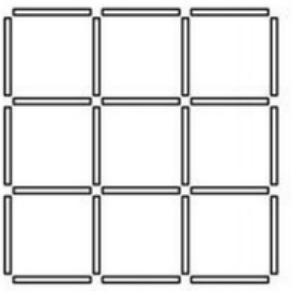
9. Anne has glued some cubes together, as shown. She rotates the solid to look at it from different angles. Which of the following can she not see?



10. Simon wants to cut a piece of thread into nine pieces of the same length and marks his cutting points. Barbara wants to cut the same piece of thread into only eight pieces of the same length and also marks her cutting points. Carl then cuts the thread at all the cutting points that are marked. How many pieces of thread does Carl obtain?

(A) 15 (B) 16 (C) 17 (D) 18 (E) 19

11. Natasha has many sticks of length 1. The sticks are coloured either blue, red, yellow or green. She wants to make a 3×3 grid, as shown, so that each 1×1 square in the grid has four sides of different colors. What is the smallest number of green sticks that she could use?



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

12. In a group of kangaroos, the two lightest kangaroos weigh 25% of the total weight of the group. The three heaviest kangaroos weigh 60% of the total weight. How many kangaroos are in the group?

(A) 6 (B) 7 (C) 8 (D) 15 (E) 20

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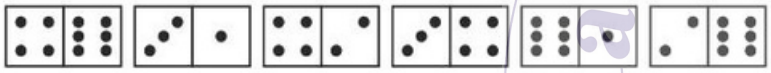
13. Dominoes are said to be arranged correctly if the number of spots at the touching ends of any two adjacent dominoes are the same. Paulius laid six dominoes in a line as shown in the figure. He can make a move by either swapping the position of any two dominoes or by rotating one domino. What is the smallest number of moves he needs to make to arrange all the dominoes correctly?



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

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14. In a class, no two boys were born on the same day of the week (Sunday, Monday, etc.) and no two girls were born in the same month. Were a new boy or a new girl to join this class, one of these two conditions would no longer be true. How many children are there in the class?

(A) 18 (B) 19 (C) 20 (D) 24 (E) 25

15. Little Red Riding Hood is delivering waffles to three grannies. She starts with a basket full of waffles. Just before she enters each of the grannies' houses, the Big Bad Wolf eats half of the waffles in her basket. When she leaves the third granny's house, she has no waffles left. She delivers the same number of waffles to each granny. Which of the following numbers definitely divides the number of waffles she started with?

(A) 4 (B) 5 (C) 6 (D) 7 (E) 9

16. Emily wants to write a number into each cell of a 3×3 table so that the sum of the numbers in any two cells that share an edge are the same. She has already written two numbers, as shown. What is the sum of all the numbers in the table?

2		
		3

(A) 18 (B) 20 (C) 21 (D) 22 (E) 23

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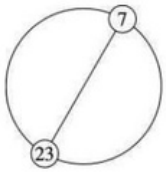
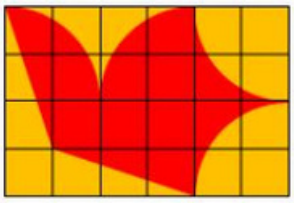
17. The integers from 1 to n, inclusive, are equally spaced in order round a circle. The diameter through the position of the integer 7 also goes through the position of 23, as shown. What is the value of n?



(A) 30 (B) 32 (C) 34 (D) 36 (E) 38

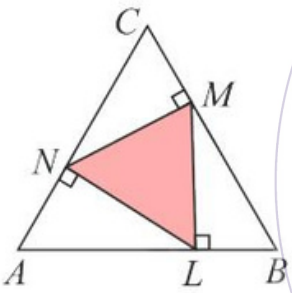
18. Freda's flying club designed a flag of a flying dove on a square grid as shown below. The area of the dove is 192 cm². All parts of the perimeter of the dove are either parts of a circle or straight lines. What are the dimensions of the flag?



(A) 6 cm × 4 cm (B) 12 cm × 8 cm (C) 20 cm × 12 cm

(D) 24 cm × 16 cm (E) 30 cm × 20 cm

19. Points N, M and L lie on the sides of the equilateral triangle ABC, such that NM⊥BC, ML⊥AB and LN⊥AC as shown in the figure. The area of triangle ABC is 36cm^2. What is the area of triangle LMN?



(A) 9 cm^2 (B) 12 cm^2 (C) 15 cm^2 (D) 16 cm^2 (E) 18 cm^2

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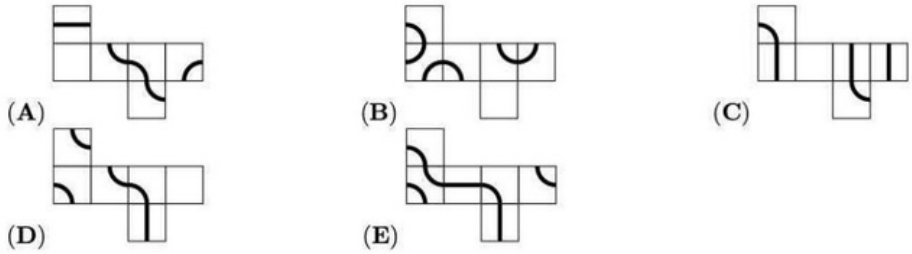
20. An ant would like to walk along a marked line on the surface of a cube until it returns to its starting point. From which one of the following nets could a cube be made so that such a journey is possible?

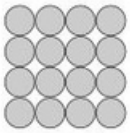


Fill-in-the-blank Questions

21. Five points lie on a line. Alex finds the distances between every possible pair of points. He obtains, in increasing order, 2, 5, 6, 8, 9, k, 15, 17, 20 and 22. What is the value of k?

22. Viola is practising for the long jump event. The average distance she has jumped so far today is 3.80 m. On her next jump, she jumped 3.99 m and her average increased to 3.81 m. What distance must she jump with her next jump to increase her average to 3.82 m?

23. Cleo builds a pyramid with metal spheres. The square base consists of 4×4 spheres as shown in the figure. The floors consist of 3×3 spheres, 2×2 spheres and a final sphere at the top. At each point of contact between two spheres, a blob of glue is placed. How many blobs of glue will Cleo place?



24. Yesterday I wrote down my friend Ekin's telephone number. The telephone number on my note has six digits, but I remember that Ekin said that the number had seven digits. I have no idea what digit I forgot to write down, or its position in the number. How many different telephone numbers do I have to try to be sure that I use the correct one? (Note that a telephone number may start with any digit, including 0.)

25. A train is made up of 18 carriages. There are 700 passengers travelling on the train. In any block of five adjacent carriages, there are 199 passengers in total. How many passengers are in the middle two carriages of the train?

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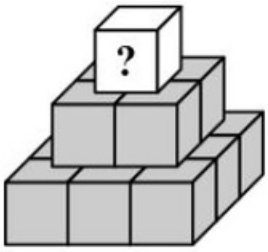
26. A cyclist rides at 5 m per second. The wheels of his bicycle have a circumference of 125 cm. How many complete turns does each wheel make in 5 seconds?

27. Irina asked five of her students how many of the five of them had studied the day before. Pol said none, Berta said only one, Ona said exactly two, Eugeni said exactly three and Gerard said exactly four. Irina knew that those students who had not studied were not telling the truth, but those who had studied were telling the truth. How many of these students had studied the day before?

28. Diana has nine numbers: 1, 2, 3, 4, 5, 6, 7, 8 and 9. She adds 2 to some of them, and 5 to all the others. What is the smallest number of different results she can obtain?

29. Irene made a "city" with identical wooden cubes. The left diagram shows the view from above the "city" and the right diagram shows the view from one of the sides. However, it is not known from which side the side view was taken. What is the largest number of cubes that Irene could have used?

30. Katie writes a different positive integer on each of the fourteen cubes in the pyramid. The sum of the nine integers written on the bottom cubes is equal to 50. The integer written on each other cube is equal to the sum of the integers written on the four cubes underneath it. What is the greatest possible integer that can be written on the top cube?



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