



FIZMAT ELEMENTARY MATH OLYMPIAD

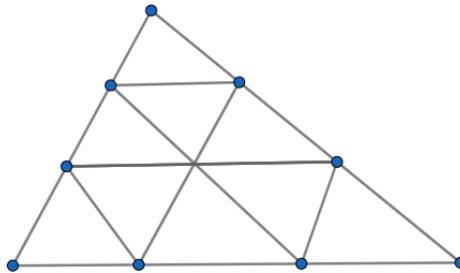
**3rd International FEMO Olympiad - Winter Round**

**1st grade**

1. Katya, Dasha, and Sasha have got kitty, fish, and puppy. Katya has no dog, Dasha's pet has no paws. What pet does Sasha have? (In the answer, write "1" if you got a fish, "2" if a kitten, "3" if a puppy.)



2. The older brother is 9 and the little brother is 7. After how many years, the sum of their ages will be 30?
3. How many triangles are there in the figure?



4. We want to cut a 20-meter-long stick into shorter 4-meter-long sticks. We can only cut one piece of the stick at a time. How many cuts are required?
5. The word "FEMO2021" is written on the running line. After every minute, the leftmost character moves and becomes the rightmost character. How many minutes will it take before the word "FEMO2021" appears on the screen again?

FEMO2021  
↓ через минуту  
EMO2021F

- In the first row, there are 4 children, in each subsequent row there is one more child than in the previous row. If there are a total of 39 children, how many children are in the last row?
- A large bottle of Coca-Cola costs 79 rubles, and a small bottle of Coca-Cola costs 31 rubles. How many rubles less is the cost of a large bottle compared to the total cost of three small bottles?



- Rearrange the numbers 38, 79, 17, 43, 74, 96, and 87 so that, starting from the second, the digit of tens is equal to the digit of units of the previous number. What number is in fourth place in such a permutation?
- At the first stop, a number of passengers boarded an empty bus. Then, at each stop, 3 people got off, and 6 people entered. There were 29 passengers on the bus between the sixth and seventh stops. How many passengers boarded at the first stop?



- Alla and Katya picked a total of 38 nuts. When they ate the nuts equally, Alla had 9 nuts left, and Katya had 13 nuts left. How many nuts did Alla pick?



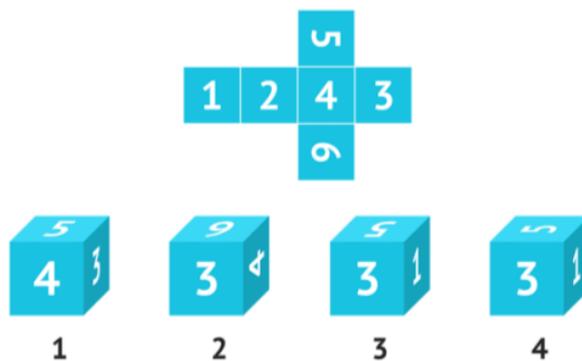


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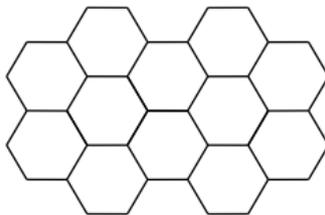
**3rd International FEMO Olympiad - Winter Round**

**2nd grade**

1. Arsen has a red box containing 7 blue boxes. Each blue box contains 6 green boxes. How many boxes does Arsen have in total?
2. Damir, Maxim and Aruzhan study in the same school, but in different classes in the 4th, 6th and 8th grade. Damir does not study in the 4th grade, Maxim does not study neither in the 6th nor 4th grade. What class does Aruzhan study in?
3. Thirty students numbered from 1 to 30 stand in a row. The teacher announces: "Students with numbers from 1 to 10 inclusive, one step forward, and with numbers from 20 to 30 inclusive, take a step back." How many students will remain in place?
4. Which cube did you get from folging the pattern in figure?



5. The length of the side of each hexagon in the figure is 1 cm. What is the perimeter in cm of the shape formed by these hexagons?

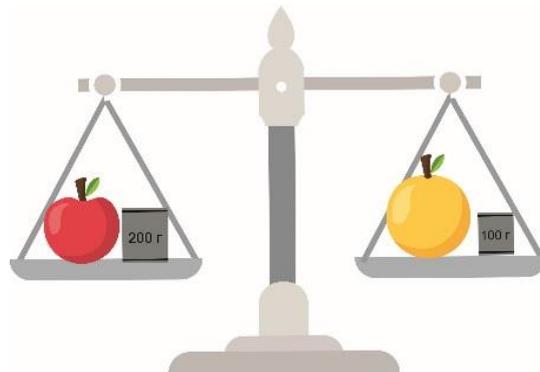


6. The weight of a pig and a dog is 64 kg, a ram and a pig is also 64 kg, and a dog and a ram are 60 kg. What is the weight of a pig?

7. At the first stop, a number of passengers boarded an empty bus. Then, at each stop, 3 people got off, and 6 people entered. There were 29 passengers on the bus between the sixth and seventh stops. How many passengers boarded at the first stop?



8. Rearrange the numbers 38, 79, 17, 43, 74, 96, and 87 so that, starting from the second, the digit of tens is equal to the digit of units of the previous number. What number is in fourth place in such a permutation?
9. Two sisters have birthdays on the same day. The older sister is 4 years older than the younger one. When the sum of their ages is 50, how old is the younger sister?
10. The total weight of apple and pear is 600 grams. When an apple was placed on one scale and pear on the other, the pear turned out to be heavier than the apple. Then the scales were leveled by placing a weight of 200 grams on the apple and a weight of 100 grams on the pear. How many grams does a pear weigh?



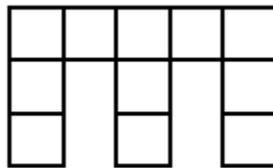


FIZMAT ELEMENTARY MATH OLYMPIAD

**3rd International FEMO Olympiad - Winter Round**

**3rd grade**

1. Arsen has a red box containing 7 blue boxes. Each blue box contains 6 green boxes. How many boxes does Arsen have in total?
2. Boris and Masha combined are 17 years, and Boris and Vanya combined are 9 years more. How old is Masha if Vanya is 15?
3. There are 30 students in the class. 15 of them are engaged in sports sections, 18 children are engaged in a drama club. How many children are engaged in both sports sections and the drama club?
4. Miras wrote a three-digit number on the board, and Alexey wrote the same number next to it but mixed up the last two digits in places. If the resulting numbers are added together, you get a four-digit sum whose first three digits are 152. What is the last digit of this sum?
5. The figure shows a figure made up of 11 squares of the same size. If the perimeter of the figure is 48 cm, what is the area of the figure in  $\text{cm}^2$ ?



6. There are 20 kids at the party. The first girl shakes hands with 7 boys. The second girl shakes hands with 8 boys. The third girl shakes hands with 9 boys and so on. The last girl shakes hands with all the boys. How many boys are there at the party?



7. Rearrange the numbers 38, 79, 17, 43, 74, 96, and 87 so that, starting from the second, the digit of tens is equal to the digit of units of the previous number. What number is in fourth place in such a permutation?
8. A worker moves 40 window panes. He gets \$2 for each transfer. However, if he breaks the glass, he will have to pay \$8 for the broken glass. If his total salary is \$60, how many windows did he break?
9. The total weight of apple and pear is 600 grams. When an apple was placed on one scale and pear on the other, the pear turned out to be heavier than the apple. Then the scales were leveled by placing a weight of 200 grams on the apple and a weight of 100 grams on the pear. How many grams does a pear weigh?



10. By pressing different buttons, the robot can move forward 1 cm, 3 cm, or 5 cm. If the buttons are pressed six times, how many different distances can the robot travel?





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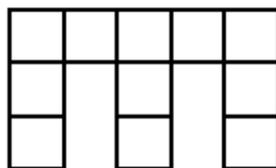
**3rd International FEMO Olympiad - Winter Round**

**4th grade**

1. There are 20 kids at the party. The first girl shakes hands with 7 boys. The second girl shakes hands with 8 boys. The third girl shakes hands with 9 boys and so on. The last girl shakes hands with all the boys. How many boys are there at the party?

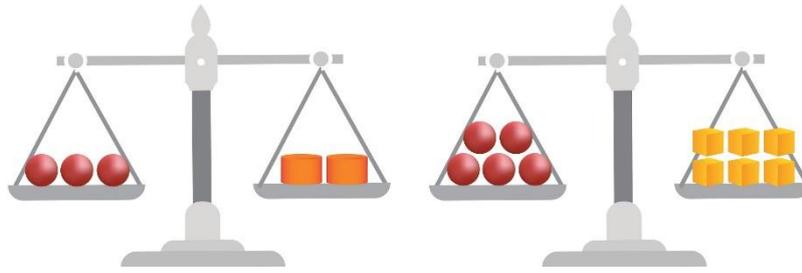


2. Timur is 2 years older than Dmitry, and they met 5 years ago. How old was Dmitry, if Timur will be 27 years old in 2 years?
3. If you write 0 to a two-digit number on the right, it will increase by 405. Find this number.
4. Students lined up in a formation. Adil is the 8th student in his column in front and the 13th from the back. To his left, there are 15 students in one row, and to his right, there are 15 students. How many students are in the formation?
5. At the restaurant, one cup of tea and two cups of coffee cost \$ 78, and three cups of tea and one cup of coffee cost \$ 94. How many dollars more is a cup of coffee worth than a cup of tea?
6. The figure shows a figure made up of 11 squares of the same size. If the perimeter of the figure is 48 cm, what is the area of the figure in  $\text{cm}^2$ ?

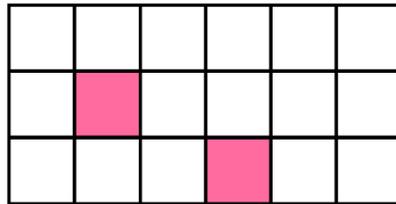


7. Each digit of a seven-digit number, which is a multiple of 3, is 0, 2, or 3, and there are more triples than zeros. If each of 0, 2, and 3 occur at least once, what is the sum of all seven digits?

8. There are three types of objects: spheres, cylinders, and cubes. Three spheres have the same total weight as two cylinders, and five spheres have the same total weight as six cubes. How many cubes will have the same total weight as five cylinders?



9. Ali decided to write down all the dates of 2021 in which only the digits 0, 1, and 2 are used. How many dates will Ali write out?
10. How many pairs of unit squares on a  $3 \times 6$  board are such that they have no common points? The diagram shows one such pair.



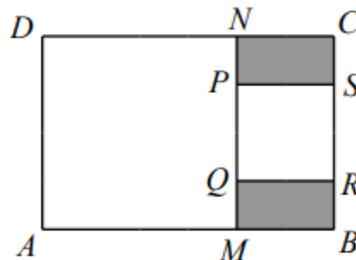


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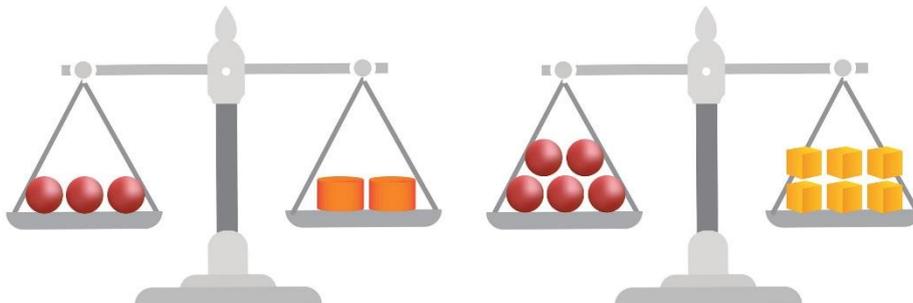
3rd International FEMO Olympiad - Winter Round

5th grade

1. In the bookstore, Arai spends half of her money on books on mathematics, and two-thirds of the remaining amount on books on Kazakh literature. She has just enough money left to buy a book on English literature, which costs \$20. How many dollars had Arai in the first place?
2. Students lined up in a formation. Adil is the 8th student in his column in front and the 13th from the back. To his left, there are 15 students in one row, and to his right, there are 15 students. How many students are in the formation?
3. The figure shows two white squares ABCD and PQRS inside the rectangle ABCD. The area of the two squares is  $16 \text{ cm}^2$  and  $4 \text{ cm}^2$ , respectively. What is the sum of the areas of the shaded areas in  $\text{cm}^2$ ?



4. At the restaurant, one cup of tea and two cups of coffee cost \$ 78, and three cups of tea and one cup of coffee cost \$ 94. How many dollars more is a cup of coffee worth than a cup of tea?
5. There are three types of objects: spheres, cylinders, and cubes. Three spheres have the same total weight as two cylinders, and five spheres have the same total weight as six cubes. How many cubes will have the same total weight as five cylinders?



6. In the family, grandfather, grandmother, father, mother, son, and daughter, all members of this family in the sum of 285 years. Grandfather is 3 years older than grandmother, the father is 3 years older than mother, the son is 3 years older than daughter, the father is older daughter 2 times, and daughter is younger grandfather 3 times. How old is grandfather?

7. Ali decided to write down all the dates of 2021 in which only the digits 0, 1, and 2 are used. How many dates will Ali write out?
8. The eight-digit phone number of Zhazira is divisible by 3 and 5. Tamerlan remembered only the first six digits: 8, 9, 2, 0, 1, and 5 in the specified order. What is the maximum number of times Tamerlan must dial a number before he dials the desired phone number?



9. The school has six clubs. Maksat wants to go to the three of them. However, two clubs are held at the same time and he can only choose one of them. How many choices does he have?
10. In sequence 1, 1, 2, 3, 5, 8, 13, 21,... each term starting from the third is the sum of the two preceding ones. How many of the first 2021 members of the sequence are divisible by 4?