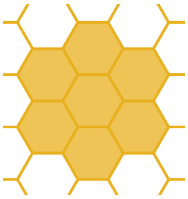
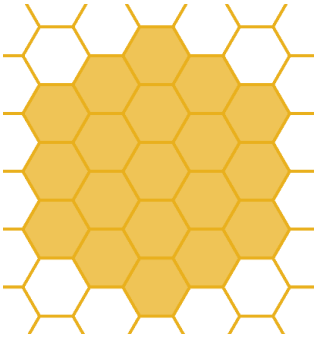
האולימפיאדה הארצית במתמטיקה לביתות ג'
שלב א, שנת תשפ"ד

1. A teacher wants to distribute markers to all the students in the class. If she gives each student 3 markers, she will have 18 markers left. But, if she tries to give each one 4 markers, one student will not get markers at all (while every other student will get all 4). How many students are there in this class?
2. A honeycomb with side of length 2 has 7 cells:



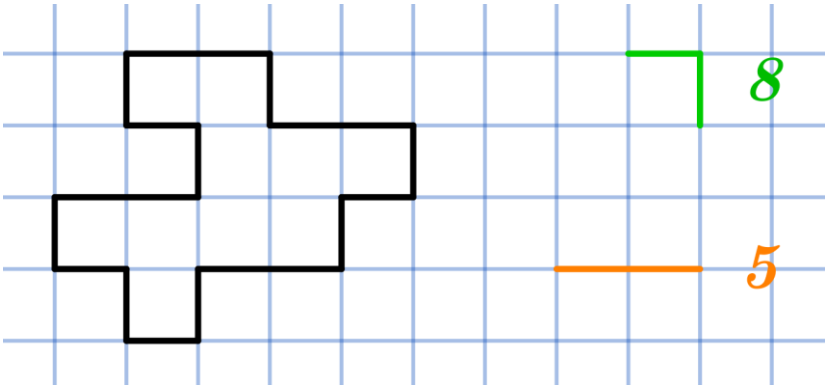
A honeycomb with side of length 3 has 19 cells:



How many cells are there in a honeycomb with side of length 100?

3. Your goal is to assemble the following frame from green and orange pieces, of the types pictured to the right of it. Each green piece costs 8 shekels, and each orange piece costs 5 shekels. What is the lowest possible total cost of the required pieces?

Note: you are also allowed to rotate the pieces.



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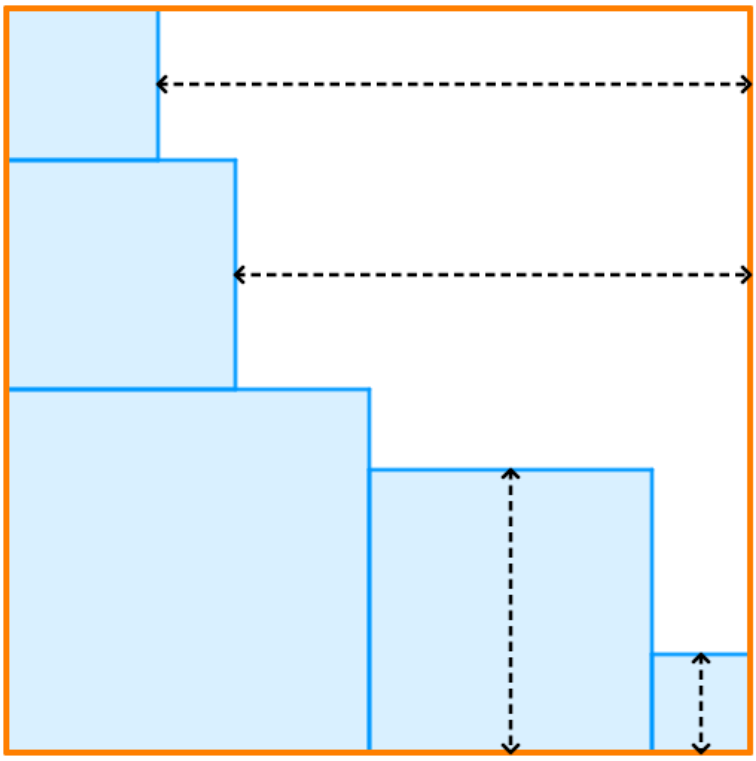
4. In the following equality, different shapes denote different digits, and identical shapes denote identical digits:

🌵 🌵 🌵 = 🌸 🌻 🌵 + 🌻 🌵 + 🌵

What is the number 🌸 🌻 🌵 ?

5. In the following picture is a square with a side 12 centimeters long, and inside it are five other squares. What is the sum of the four marked (dashed) lengths?



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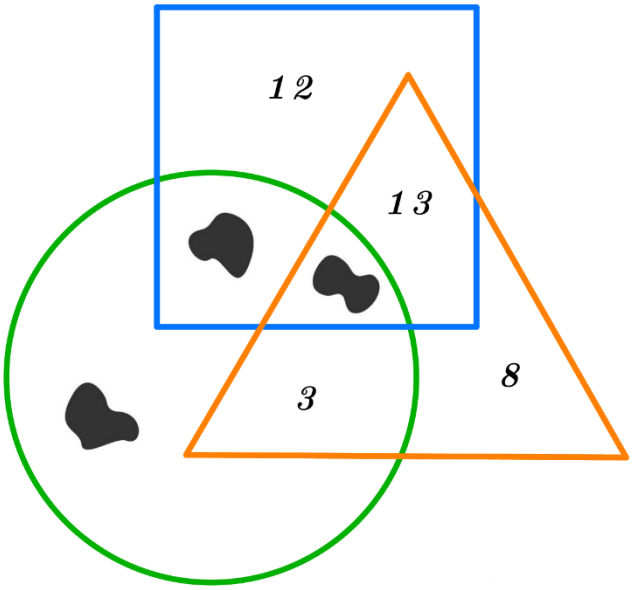
6. In the picture is a map of a magical land. Everyone who lives inside the circle likes the color green. Everyone who lives inside the square, likes the color blue. Everyone who lives in the triangle, likes the color orange. Some might like more than one color.



On some of the areas it is written how many people reside there. *For example, 3 people like orange and green and do not like blue.*

The captions on some areas have been omitted.

The number of all the residents who like blue is 10 more than the number of all the residents who like orange. Also, the number of all the residents who like orange is 5 more than the number of all the residents who like green.

How many residents of the magical land love the color green and no other color?

בהצלחה!