



Israeli Mathematical Olympiad for 3-4 grades

Final stage 2019

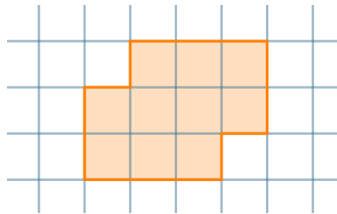
1. Draw 5 straight lines, that intersect each other in exactly 8 different points.
2. Samuel has 4 children: Ohad, Benny, Guy and Dor. Each of them has one drink he likes: water, cola, grape juice and orange juice (no 2 people like the same drink). Each of them also has a subject that he likes: math, physics, computer science and chemistry (but no 2 people like the same subject).

Also known that:

1. Ohad loves computer science
2. The one who loves math doesn't drink orange juice
3. Dor doesn't like physics
4. Benny drinks water
5. Guy doesn't drink grape juice
6. The one who loves chemistry drinks grape juice
7. Benny doesn't like math

Who likes cola?

3. Cut the following figure into four congruent (equal) parts:



4. Assemble three numbers from the digits 1, 2, 3, 4, 5, 6, 7, 8, 9, so one of them will be the sum of the other two. Each digit must be used exactly once.
5. What is the number of possible results of the exercises of the type:

$$\text{😊} + \text{😞}$$

where 😊 and 😞 are different single-digit positive numbers? Prove your answer.

6. Rachel has three cards with different digits, all larger than 0. Rachel made all the possible three-digit numbers from these cards and calculated the sum of all those numbers. Prove that the sum is divisible by 3.

Good luck!