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by parmenides51

–	level 2
1	Inés chose four different digits from the set $\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$. He formed with them all possible four-digit numbers and added all those four-digit numbers. The result is 193314. Find the four digits Inés chose.
2	Let ABC be an equilateral triangle. N is a point on the side AC such that $\vec{AC} = 7\vec{AN}$, M is a point on the side AB such that MN is parallel to BC and P is a point on the side BC such that MP is parallel to AC. Find the ratio of areas $\frac{(MNP)}{(ABC)}$
3	Given a 4×4 grid board with each square painted a different color, you want to cut it into two pieces of equal area by making a single cut along the grid lines. In how many ways can it be done?
4	A regular octagon is drawn on the patio floor. Emiliano writes in the vertices the numbers from 1 to 8 in any order. Put a stone at point 1. He walks towards point 2, having traveled $1/2$ of the way he stops and leaves the second stone. From there he walks to point 3, having traveled $1/3$ of the way, he stops and leaves the third stone. From there he walks to point 4, having traveled $1/4$ of the way, he stops and leaves the fourth stone. This goes on until, after leaving the seventh stone, he walks towards point 8 and having traveled $1/8$ of the way, he leaves the eighth stone. The number of stones left in the center of the octagon depends on the order in which you wrote the numbers on the vertices. What is the greatest number of stones that can remain in that center?
5	On planet $X31$ there are only two types of tickets, however the system is not so bad because there are only fifteen full prices that cannot be paid exactly (you pay more and receive change). If 18 is one of those prices that cannot be paid exactly, find the value of each type of bill.
–	level 1
1	With six rods a piece like the one in the figure is constructed. The three outer rods are equal to each other. The three inner rods are equal to each other. You want to paint each rod a single color so that at each joining point, the three arriving rods have a different color. The rods can only be painted blue, white, red or green. In how many ways can the piece be painted? https://cdn.artofproblemsolving.com/attachments/1/1/91e6b388498613486477ab6b51735055e920c gif

2 There are 1998 rectangular pieces 2 cm wide and 3 cm long and with them squares are assembled (without overlapping or gaps). What is the greatest number of different squares that can be had at the same time?

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3 There are four boats on one of the river banks; their names are Eight, Four, Two and One, because that is the number of hours it takes each of them to cross the river. One boat can be tied to another, but not more than one, and then the time it takes to cross is equal to that of the slower of the two boats. A single sailor must take all the boats to the other shore. What is the least amount of time you need to complete the move?

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4 $ABCD$ is a square of center O. On the sides DC and AD the equilateral triangles DAF and DCE have been constructed. Decide if the area of the EDF triangle is greater, less or equal to the area of the DOC triangle.

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s1600/may4_2.gif

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5 Choose a four-digit number (none of them zero) and, starting with it, build a list of 21 different numbers, each with four digits, that satisfies the following rule: after writing each new number in the list, all the averages are calculated Between two digits of that number, those averages that do not give a whole number are discarded, and with the rest a four-digit number is formed that will occupy the next place in the list. For example, if 2946 was written in the list, the next one can be 3333 or 3434 or 5345 or any other number armed with the figures 3, 4 or 5.
