Sigma Tournament

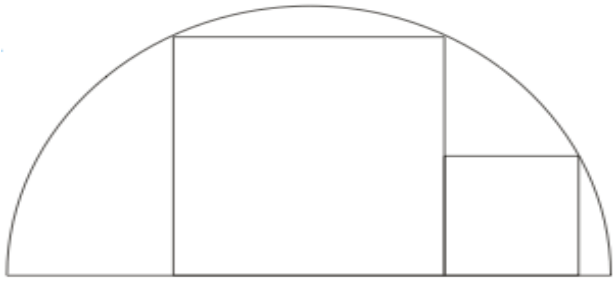
Day 4: Math

Tour 1

1) You roll two identical fair 6-sided dice. What is the probability that the outcome of one of the dice is greater than 1 AND the outcome of the other is greater than 2. [The order of dice is not important.]

2) Nine digits 1, 2, 3, …, 9 are arranged on a circle in an arbitrary order. Every three consecutive digits read clockwise form a three-digit number. Find the sum of all nine of these three-digit numbers.

3) Two squares are inscribed into a semi-circle as shown in the figure. Find the ratio of areas of these squares. [the figure is not in scale]



4) How many bit strings of length 6 don't contain combination 00?
Remark: A "bit string" is defined as a sequence of 0 and 1.

5) Compute the product

$(1^2 + 6\times1 - 315)(2^2 + 6\times2 - 315) \ldots (42^2 + 6\times42 - 315)$

Sigma Tournament

Day 1: Physics & Math

Tour 2

Experimental problem!
(4 points for a complete solution)

Below the names of months are given in Georgian graphics (order is random). Translate these names into English.

თებერვალი, აპრილი, ივლისი, დეკემბერი, სექტემბერი, აგვისტო, იანვარი, ივნისი, მაისი, მარტი, ნოემბერი ოქტომბერი.

Hints:

1. There is some similarity between Georgian and English names of months, but it is not exact. As an analogy, compare English "January" with German "Januar" or French "Janvier".
2. Georgian language is phonetic [letters roughly correspond to sounds].
3. Georgian language is written from left to right (as in English).