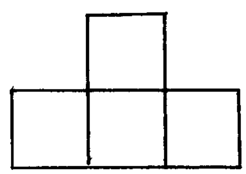
12. Can a 10×10 chessboard be paved by tiles of the form



13. Let abc be a three-digit number, divisible by 37. Prove that $cab + bca$ is also divisible by 37.

14 (a) Prove that all the numbers of the form 1156, 111556, 11115556, ... are complete squares.

(b) Find all the triples of digits a, b, c, with $a \neq 0$, such that all the numbers of the form $aabc$, $aaabbc$, $aaaabbbc$, ... are complete squares.

15 Let n be a natural number, not divisible by 2 or 5. Prove that there exists a natural number which involves only the digit 1 and no other digits (when written in decimal), divisible by n.

16* In a certain school $2n$ subjects are taught. It is known that each student got only A's and B's in all the subjects. Moreover no two students have identical marks and no student S is better than any other student T in the sense that the set of subjects in which S got A's does not contain the set of subjects in which T got A's. Prove that the number of students in the school is at most $\frac{(2n)!}{(n!)^2}$.