Problem ?: Square Formations

Raúl and Jaime, as you may recall, are two young and bright brothers who love games. Jaime has received as a present a set of little plastic soldiers, and he happily shares it with Raúl every time they get together to play.

Their greatest source of amusement comes from arranging their groups of soldiers in different ways. Raúl, for instance, likes to vary his formation patterns and arrange his platoons in circular or elliptic shapes, while Jaime undoubtedly prefers square formations for his soldiers—in which the number of rows is equal to the number of columns.

One day, Raúl organizes a surprise attack using two platoons of soldiers, attacking two opposing flanks. This baffles Jaime, who after a long pause to think about it, discovers that when he divides his square formation into two, it becomes impossible to reassemble the halves in new square formations, and this happens regardless of the number of soldiers in his original formation.

Raúl pauses to think about this too, and eventually presents Jaime with an alternative: he can prepare a first group of N soldiers (N being a positive, even integer), and maintain two auxiliary groups of K soldiers. If N and K are chosen carefully, Raúl explains, then it is possible to create square formations with $N + K$ and $(N/2) + K$ soldiers.

Jaime likes the elegance of this idea, and doesn't take long to discover an example that illustrates Raúl's suggestion: if he keeps a main group of 14 soldiers, and two auxiliary groups with 2 soldiers each, then he can use one of the auxiliary groups to produce a main formation of 16 soldiers, and if he needs to split his main platoon into two, then he can produce two minor square formations of 9 soldiers. So, $N = 14, K = 2$ is a valid choice for Jaime.

According to this, we'll say that a pair of integers (N, K) is valid if it holds for Raúl's proposition; that is, if it is possible to produce square formations with groups of $N + K$ and $(N/2) + K$ soldiers. The question in their minds now is: given an arbitrary value of K, what would be the lowest possible N that generates a valid pair?

Input

Input starts with a positive integer T, that denotes the number of test cases.

Each test case is described by a single integer K in its own line. It can be safely assumed that all test cases have a solution in which N is a number not greater than 10^6.

$T \leqslant 1000$; $1 \leqslant K \leqslant 1000$

Output

For each test case, print the case number, followed by the value of N. This number must be the lowest integer possible, such that (N, K) forms a valid pair according to Raúl's proposition.

Sample Input	Output for Sample Input
3 1 2 36	Case 1: 48 Case 2: 14 Case 3: 1728

Problem Setter: Leonardo B.