H. Game of Archers

Score: 1

CPU: 1s
Memory: 1024MB

N archers are playing a game. It's an infinite game actually. In each round of the game all the archers shoot simultaneously their arrows. The probability of the i-th archer shooting the target successfully is $\mathbf{P_i}$. If in any round, at least one archer succeeds to shoot the target, the game is finished. In the final round, if there is only one archer who has successfully shot the target, then he gets **300** points. If there are more than one archer who has successfully shot the target, then each of them gets **100** points. Now you have to find the expected point of each of the archer.

Input

In the first line, an integer T denoting the number of test cases, will be given. After that T test cases will follow. In each case, the first line will contain an integer, N. The second line will contain N real numbers. The i-th of these numbers will denote $\mathbf{P_i}$ (The probability of the i-th archer successfully shooting the target.)

Output

Print the case number and then N numbers where the i-th number should denote the expected points of the i-th archer.**The number should have exactly 4 digits after the decimal point.**

Constraint

1 <= T <= 10000

1 <= N <= 20

0 <= P_i <= 1

Sample

Input	Output
2 3 0.5 0.5 0.5 2 0.235 0.91	Case 1: 85.7143 85.7143 85.7143 Case 2: 29.7804 247.2534