GRAVITATION, n.

"The tendency of all bodies to approach one another with a strength proportion to the quantity of matter they contain – the quantity of matter they contain being ascertained by the strength of their tendency to approach one another. This is a lovely and edifying illustration of how science, having made A the proof of B, makes B the proof of A."

Ambrose Bierce

You have a population of k Tribbles. This particular species of Tribbles live for exactly one day and then die. Just before death, a single Tribble has the probability P_i of giving birth to i more Tribbles. What is the probability that after m generations, every Tribble will be dead?

Input

The first line of input gives the number of cases, N. N test cases follow. Each one starts with a line containing n $(1 \le n \le 1000)$, k $(0 \le k \le 1000)$ and m $(0 \le m \le 1000)$. The next n lines will give the probabilities $P_0, P_1, \ldots, P_{n-1}$.

Output

For each test case, output one line containing 'Case #x:' followed by the answer, correct up to an absolute or relative error of 10^{-6} .

Sample Input

4 3 1 1 0.33 0.34 0.33 3 1 2 0.33 0.34 0.33 3 1 2 0.5 0.0 0.5 4 2 2 0.5 0.0 0.0 0.5

Sample Output

Case #1: 0.3300000 Case #2: 0.4781370 Case #3: 0.6250000 Case #4: 0.3164062