

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 ($1 \leq n \leq 1000$), k ($0 \leq k \leq 1000$) and m ($0 \leq m \leq 1000$). The next n lines will give the probabilities P_0, P_1, \dots, 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
```