Problem G. Guess the Distribution

Input file:	*standard input*
Output file:	*standard output*
Time limit:	5 seconds
Memory limit:	256 mebibytes

Let $p \in (0; 1)$ be a real number and $n \in [1; 100]$ be a positive integer. Consider $\xi_1, \xi_2, \ldots, \xi_n$ — independent random variables such that $P(\xi_i = 1) = p$ and $P(\xi_i = 0) = 1 - p$. Consider the random variable

$$\theta_n = \frac{\xi_1 + \ldots + \xi_n + u - np}{\sqrt{np(1-p)}},$$

where u is a random variable which is uniformly distributed in $[-\frac{1}{2}, \frac{1}{2}]$ independently from all ξ_i.

You are given p and a sample from the distribution θ_n for some n. You need to determine n.

Input

The first line of input contains one integer T ($T = 30$) — the number of samples.

The second line contains a real number $p \in (0; 1)$ with at most two digits after the decimal point.

Each of next T lines contains the description of the sample. It consists of an integer N ($N = 10^4$) — the size of the sample, and N space-separated real numbers $x_1, x_2, \ldots, x_N$ with at most 10 digits after decimal point, describing the sample of the distribution θ_n for some n.

It is guaranteed that the test case is generated as follows: we choose p and seed s by hand and then choose all n as T random integers from $[1; 100]$ using a pseudo-random number generator with initial seed s.

In the sample test case $T = 2$ and $N = 3$ just to show the format.

Output

For each of T samples print one integer on a separate line — the number $ans_i \in [1; 100]$ which you think defines the distribution θ_n.

Your answer for the whole test case will be considered correct, if the average absolute error does not exceed 5, so that

$$\frac{1}{T}\sum_{i=1}^{T} |n_i - ans_i| \le 5.$$

Example

standard input	standard output
2 0.5 3 0.1 0.05 -0.2 3 0.05 -0.1 0.01	3 7