An impatient catbug

Description

You are an impatient catbug living in the Catbug Kingdom. Because you hate walking outside at the morning, you always take bus to go to work.

Since the bus you take only has two stops (and one is right next to your house), you spend most of your time queuing and waiting others to get off or get on the bus. However, you also hate waiting. So you, as an unscrupulous catbug, decide to cut in the queue at any position (But you will stay in the queue then). You wanna minimize the average time of waiting, by cutting in the queue at right position.

According to your observation, the line of waiting the bus is a queue. When a bus arrives, the catbugs will **attempt** to get on the bus one by one: The first catbug will check if the bus is full. If the bus is not full, it will get on the bus, letting the next catbug in the queue repeats such process. On the other hand, if the bus is full, the bus will drive away and catbugs who are still in the queue should wait for B seconds until the next bus come. When a catbug checks, the probability that the bus is not full is a constant P (No matter how many catbugs have gotten on the bus before it).

To make things worse, you have to wait catbugs get off the bus as well. The bus is a stack, so you have to wait K catbugs to get off if K catbugs got on the bus after you. Waiting a catbug get on or get off the bus takes A seconds.

To summarize, you have to find the best position of the queue to cut in to minimize the average of your waiting time. The waiting time is the summation of waiting catbugs in front of you get on buses, waiting next buses come, and waiting catbugs, which got on the bus after you, get on and get off.

And to simplify the problem, you may assume the waiting queue is infinitely long and there is a bus arriving at time 0.

Input

There is an integer in the first line, indicating the number of test cases. The next T lines represent a test case each, consisting of two integers and a real number A, B, P, which are described above.

- $1 \leq T \leq 100000$
- $1 \leq A, B \leq 100000$
- $0.001 \leq P \leq 0.999$
- $1000 \times P$ is integral

Output

Output how many seconds you need to wait in average. The relative error of your answer should be in 10^{-6}.

Sample Input

```
2
1 1 0.500
1 2 0.750
```

Sample Output

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3.000000000
6.666666667
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