

Hunger Game

Description

Sean like to spend his free time on the popular computer game **Faminecraft**, but now he is facing a difficult problem. In the world of Faminecraft, Sean is in his house and would like to go to his farm, which is d -meters away from the house. Since the game is about famine, players' food levels are important: Players must keep his food level at exactly 0 all the times, or they will die. As a result, while Sean is moving, he has to eat French fries with constant speed: 1-kilogram per meter.

Sean has collected c kilogram French fries in his house. He can bring at most k kilogram French fries with him when he is moving. Sean can turn back to bring more French fries wherever he likes during the tour. He can also place some French fries on the ground and take it back later. Sean already knows the distance d and the amount of French fries c in his house, now he want to find the minimal k allowing him to go to his farm successfully.

Input

The first line contains an integer T , the number of test cases. Each test case only contains two real numbers d and c .

- $1 \leq T \leq 1000$
- $1 \leq d \leq 100$
- $d \leq c \leq 100d$
- Both $100 \times d$ and $100 \times c$ are integers

Output

For each test case, output the minimal value of k . Your answer can have relative error not more than 10^{-5} .

Sample Input

```
3
10.00 10.00
70.00 90.00
50.00 216.00
```

Sample Output

```
10.000000000
60.000000000
24.041918940
```