

6972 Domination

Edward is the headmaster of Marjar University. He is enthusiastic about chess and often plays chess with his friends. What's more, he bought a large decorative chessboard with N rows and M columns.

Every day after work, Edward will place a chess piece on a random empty cell. A few days later, he found the chessboard was *dominated* by the chess pieces. That means there is at least one chess piece in every row. Also, there is at least one chess piece in every column.

“That's interesting!” Edward said. He wants to know the expectation number of days to make an empty chessboard of $N \times M$ dominated. Please write a program to help him.

Input

There are multiple test cases. The first line of input contains an integer T indicating the number of test cases. For each test case:

There are only two integers N and M ($1 \leq N, M \leq 50$).

Output

For each test case, output the expectation number of days.

Any solution with a relative or absolute error of at most 10^{-8} will be accepted.

Sample Input

```
2
1 3
2 2
```

Sample Output

```
3.000000000000
2.666666666667
```