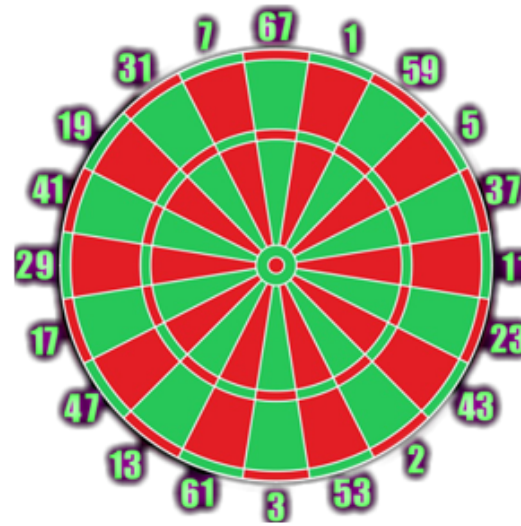
We can not be anything without playing to be.
Jean-Paul Sartre

A dartboard manufacturer wants to revolutionize the game of darts, creating a *prime* dartboard for math geeks. He has designed several boards with different numbers of areas, so that a board with n areas has the following scores: the first area is worth 1 point, the remaining $n-1$ areas have a value corresponding to the first $n-1$ prime numbers.

For example, a prime dartboard with 20 areas could be as in the picture on the right:



We want to know the minimum number of darts needed to obtain a score of q points on a prime dartboard of size n.

Input

The first line of the input contains an integer, t, indicating the number of prime dartboards.

For each case, there is a line with two numbers separated by a space. The first one, n, represents the number of areas of the board, with $1 \leq n \leq 100$, and the second number, q, indicates the score we have to get, with $1 \leq q \leq 5000$.

Output

For each test case, the output should consist of one line showing the minimum number of darts needed to obtain a q points on a prime dartboard of size n.

Sample Input

```
6
1 200
5 15
5 34
6 34
7 4
20 1000
```

Sample Output

```
200
3
6
4
2
16
```