Summing to a Square Prime

$S_{P2} = \{p \mid p: \mathrm{prime} \wedge (\exists x_1, x_2 \in \mathbb{Z}, p = x_1^2 + x_2^2) \}$ is the set of all primes that can be represented as the sum of two squares. The function $S_{P2}(n)$ gives the nth prime number from the set S_{P2}. Now, given two integers n ($0 < n < 501$) and k ($0 < k < 4$), find $p(S_{P2}(n), k)$ where $p(a, b)$ gives the number of unordered ways to sum to the given total 'a' with 'b' as its largest possible part. For example: $p(5, 2) = 3$ (i.e. $2+2+1$, $2+1+1+1$, and $1+1+1+1+1$). Here 5 is the total with 2 as its largest possible part.

Input

The first line gives the number of test cases T followed by T lines of integer pairs, n and k.

Constraints

- $0 < T < 501$
- $0 < n < 501$
- $1 < S_{P2}(n) < 7994$
- $0 < k < 4$

Output

The $p(S_{P2}(n), k)$ for each n and k. Append a newline character to every test cases' answer.

Example

Input:
3
2 2
3 2
5 3

Output:
3
7
85