

# Polygons



Consider a regular polygon with  $N$  vertices labelled  $1..N$ . In how many ways can you draw  $K$  diagonals such that no two diagonals intersect at a point strictly inside the polygon? A diagonal is a line segment joining two non adjacent vertices of the polygon.

**Input:**

The first line contains the number of test cases  $T$ . Each of the next  $T$  lines contain two integers  $N$  and  $K$ .

**Output:**

Output  $T$  lines, one corresponding to each test case. Since the answer can be really huge, output it modulo 1000003.

**Constraints:**

$1 \leq T \leq 10000$

$4 \leq N \leq 10^9$

$1 \leq K \leq N$

**Sample Input:**

```
3
4 1
5 2
5 3
```

**Sample Output:**

```
2
5
0
```

**Explanation:**

For the first case, there are clearly 2 ways to draw 1 diagonal - 1 to 3, or 2 to 4. (Assuming the vertices are labelled  $1..N$  in cyclic order).

For the third case, at most 2 non-intersecting diagonals can be drawn in a 5-gon, and so the answer is 0.