

## Problem E. Direction Change

**Time limit** 1000 ms

**Mem limit** 262144 kB

You are given a grid with  $n$  rows and  $m$  columns. Rows and columns are numbered from 1 to  $n$ , and from 1 to  $m$ . The intersection of the  $a$ -th row and  $b$ -th column is denoted by  $(a, b)$ .

Initially, you are standing in the top left corner  $(1, 1)$ . Your goal is to reach the bottom right corner  $(n, m)$ .

You can move in four directions from  $(a, b)$ : up to  $(a - 1, b)$ , down to  $(a + 1, b)$ , left to  $(a, b - 1)$  or right to  $(a, b + 1)$ .

You cannot move in the same direction in two consecutive moves, and you cannot leave the grid. What is the minimum number of moves to reach  $(n, m)$ ?

### Input

The input consists of multiple test cases. The first line contains a single integer  $t$  ( $1 \leq t \leq 10^3$ ) — the number of the test cases. The description of the test cases follows.

The first line of each test case contains two integers  $n$  and  $m$  ( $1 \leq n, m \leq 10^9$ ) — the size of the grid.

### Output

For each test case, print a single integer:  $-1$  if it is impossible to reach  $(n, m)$  under the given conditions, otherwise the minimum number of moves.

### Sample 1

Input	Output
6	0
1 1	1
2 1	-1
1 3	6
4 2	10
4 6	17
10 5	

### Note

Test case 1:  $n = 1$ ,  $m = 1$ , and initially you are standing in  $(1, 1)$  so 0 move is required to reach  $(n, m) = (1, 1)$ .

Test case 2: you should go down to reach  $(2, 1)$ .

Test case 3: it is impossible to reach  $(1, 3)$  without moving right two consecutive times, or without leaving the grid.

Test case 4: an optimal moving sequence could be:  $(1, 1) \rightarrow (1, 2) \rightarrow (2, 2) \rightarrow (2, 1) \rightarrow (3, 1) \rightarrow (3, 2) \rightarrow (4, 2)$ . It can be proved that this is the optimal solution. So the answer is 6.