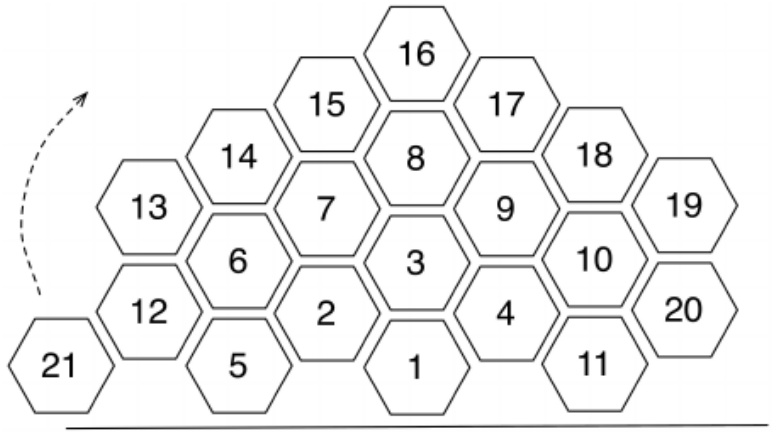
There is an infinite beehive like the one given in the figure. We consider two cells to be adjacent if and only if they share a side. A path of length k from cell c_0 to cell c_k is a sequence of cells $c_0, c_1, \ldots, c_k$ such that c_i and c_{i+1} are adjacent for all $0 \leq i < k$. The distance between cells i and j is the length of the shortest path from cell i to cell j.



The cells of the beehive are indexed using positive integers as shown. The cells with larger distance from cell 1 are given larger indices. The indices of cells with the same distance from cell 1 increases from left to right. Each positive integer is the index of exactly one cell.

We want to know the distance of two cells whose indices are given.

Input

There are multiple test cases in the input. Each test case is a single line containing two space-separated integers i and j as the indices of two cells ($1 \leq i, j \leq 10^4$). The input terminates with a line containing '`0 0`' which should not be processed as a test case.

Output

For each test case, output a single line containing the distance of the given cells.

Sample Input

```
8 4
11 12
365 365
0 0
```

Sample Output

```
2
5
0
```