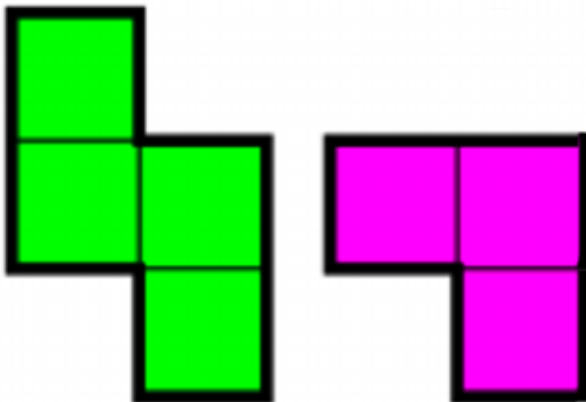


Kid's are playing a tiling game. First they draw an $N \times M$ rectangle with N rows and M columns ($N * M$ squares), then they try to cover it completely with the 2 wooden pieces shown in the figure at the right (left piece covers 4 squares, while right piece covers 3). Note that the pieces can be rotated or flipped. Compute the minimum number of puzzle pieces required, or output '-1' if it's not possible.



Input

A number of of inputs (≤ 1000), each starting with n, m ($1 \leq n, m \leq 1000000000$) on a line.

Output

For each input, output the minimum number of puzzle pieces, or '-1' if it's not possible.

Sample Input

```
1 1
2 3
```

Sample Output

```
-1
2
```