The cannibals and the missionaries

Task

There are n cannibals and m missionaries on a side of a river and they want to get on the other side. For this purpose they can use a boat, that can carry at most k persons. The problem is, that if the number of the cannibals is greater than the number of the missionaries at either side of the river, or in the boat, the cannibals eat the missionaries (and obviously that cannot happen). Your task is to determine whether there is a possibility for the cannibals and the missionaries to get on the other side of the river. If such a possibility does exist, you must determine the minimum number of "turns" in which the task can be solved. We call a "turn", when the boat traverses the river in any direction.

Input

The input will consist of several cases. Each line will contain n, m and k, separated by a single space. The last line will contain $n = m = k = -1$ and should be not processed.

Output

For each line of the input (except the last one), you should output a single number (each number on a separate line). If there is no way to solve the problem, output -1, otherwise output the minimal number of "turns".

Specifications

- $0 \leq n \leq m \leq 500$
- $1 \leq k \leq 1000$
- The input can contain up to 70000 cases
- At least 99,9% of the cases will have $m \leq 50$

Example

Input	Output
1 1 1	-1
1 1 2	1
-1 -1 -1	