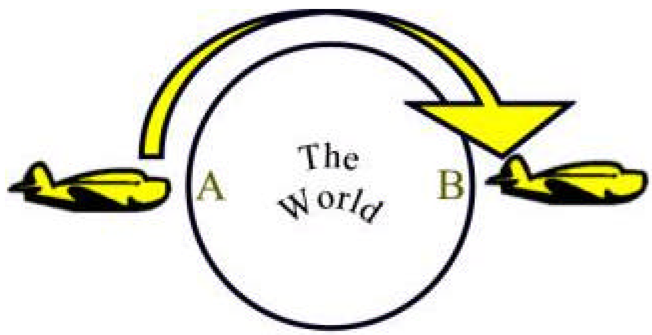
Problem I
Planes around the World

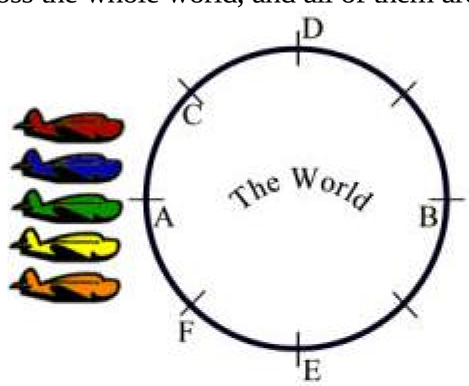
Input: Standard Input
Output: Standard Output
Time Limit: 2 Seconds

We have many planes at a place A, each of them can fly a/b of the world with a full tank. For example, if a = 1, b = 2, Each plane can cover half of the world(that is, from A to B), shown in picture 1:



Picture 1 - If a=1 and b=2 then the plane can start from A and cover half circle to reach place B

With the help of hi-technology, planes can exchange fuel in no time (but remember that the amount of fuel a plane can carry cannot exceed the capacity of the tank at any time!), we can use more planes to ensure that one of them flies across the whole world, and all of them are able to be back to A at last.

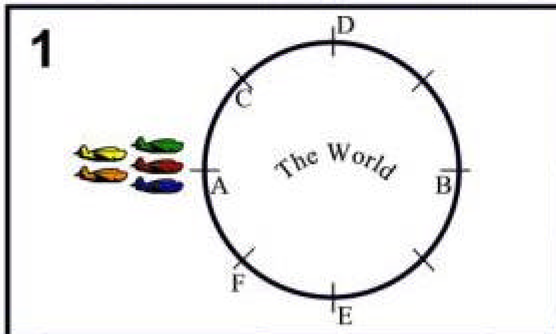


Picture 2: If a=1 and b=2 then five planes are enough to ensure that one of them flies round the whole world.
(C is at 1/8, D is at 1/4, E at 3/4, F at 7/8)

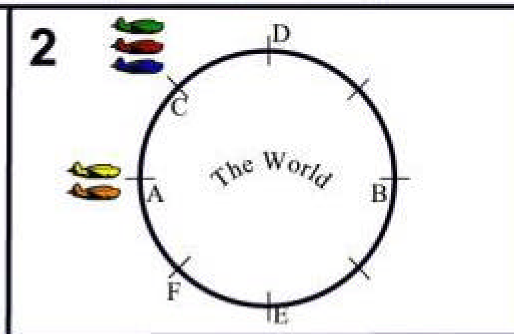
For example, 5 planes are enough for a = 1, b = 2, shown in picture 2:

The picture below gives the explanation. If you can figure it out yourself, just ignore the figure below (or next page)

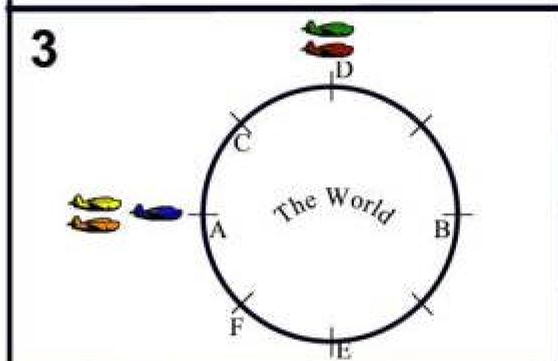
Plane #1. Plane #2. Plane #3. Plane #4. Plane #5.



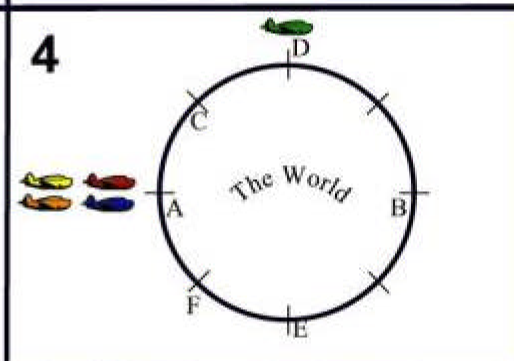
Three planes #1, #2, #3 set off from point A



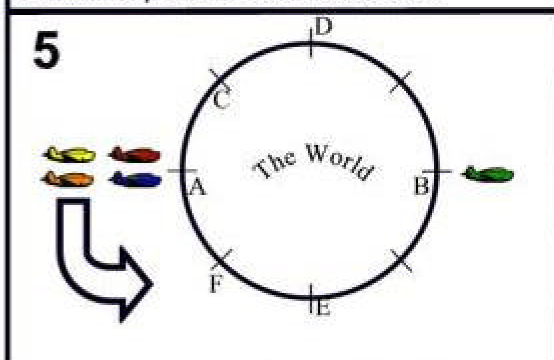
At C, Plane #3 fills plane #1 and #2 to their maximal capacity, then starts back to A.



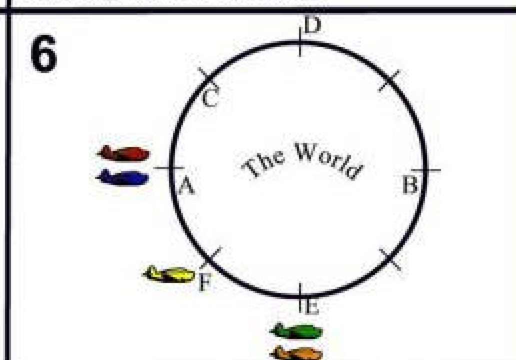
Plane #3 reaches A with an empty tank. At the same time plane #1 and #2 are at D.



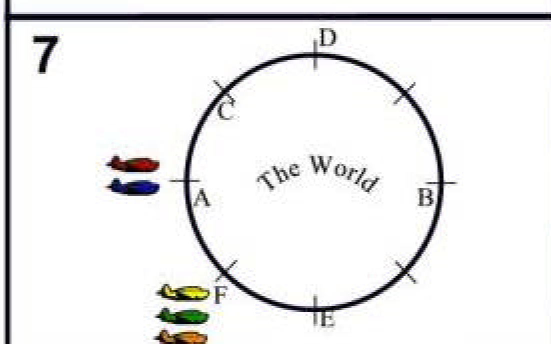
Plane #2 fills plane #1 to its maximal capacity, then turns back.



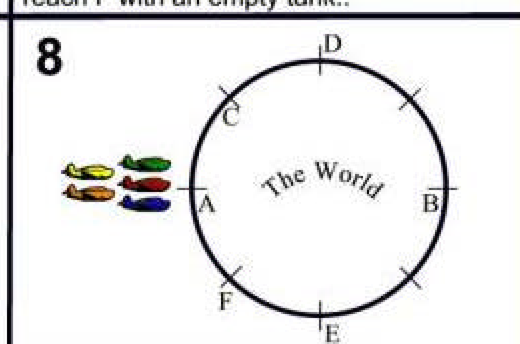
When plane #1 reaches B, two planes #4 and #5 set off from A but fly along the lower half.



Plane #4 waits at F and #5 meets #1 at E. Now plane #5 fills #1 so that they can both reach F with an empty tank..



Plane #5 and #1 meet #4 at F, then plane #4 filles #5 and #1 so that they can fly back to A.



All is well that ends well :). Everyone back to A.

So complicated, right? For simplicity, we restrict the way to the following:

1. Plane #1 is the only one, which flies around the whole world.
2. Except plane #1, every plane fill other planes exactly once.
3. There are A planes that set off together with plane #1 at the same time, each of them turns back at some time, and gives as much fuel as possible evenly to other planes before it turns back.
4. There are B planes that set off separately, waiting at B places to provide fuel for plane #1. When meets plane #1, every plane turns back and gives fuel to other planes so that every plane with it has the same amount of fuel.

What is the minimal number of planes required?

Input

The first line of the input contains a single integer **t(1 <= t <= 50)**, the number of test cases followed.

For each case, two integers **a** and **b(0 <= a,b <= 150)** are separated by a single space. Of course **b** will not be zero.

Output

For each test case, print the case number and the minimal number of planes required. If **10000** planes are not enough, output a **-1**.

Sample Input	Output for Sample Input
3 1 2 1 3 2 5	Case 1: 5 Case 2: -1 Case 3: 13

Problemsetter: Rujia Liu, Member of Elite Problemsetters' Panel
Special Thanks: **Shahriar Manzoor** (Drawing pictures)
Jimmy Mårdell (Alternate Solution)

"Problem E. No limitation on the number of test cases, time complexity... like Chinese people...:)"

-Rujia Liu (In an email describing the mistakes of a problem E of some contest)