

## A. Success Rate

time limit per test: 2 seconds  
memory limit per test: 256 megabytes  
input: standard input  
output: standard output

You are an experienced Codeforces user. Today you found out that during your activity on Codeforces you have made  $y$  submissions, out of which  $x$  have been successful. Thus, your current success rate on Codeforces is equal to  $x / y$ .

Your favorite rational number in the  $[0; 1]$  range is  $p / q$ . Now you wonder: what is the smallest number of submissions you have to make if you want your success rate to be  $p / q$ ?

### Input

The first line contains a single integer  $t$  ( $1 \leq t \leq 1000$ ) — the number of test cases.

Each of the next  $t$  lines contains four integers  $x, y, p$  and  $q$  ( $0 \leq x \leq y \leq 10^9$ ;  $0 \leq p \leq q \leq 10^9$ ;  $y > 0$ ;  $q > 0$ ).

It is guaranteed that  $p / q$  is an irreducible fraction.

**Hacks.** For hacks, an additional constraint of  $t \leq 5$  must be met.

### Output

For each test case, output a single integer equal to the smallest number of submissions you have to make if you want your success rate to be equal to your favorite rational number, or  $-1$  if this is impossible to achieve.

### Example

input
4 3 10 1 2 7 14 3 8 20 70 2 7 5 6 1 1
output
4 10 0 -1

### Note

In the first example, you have to make 4 successful submissions. Your success rate will be equal to  $7 / 14$ , or  $1 / 2$ .

In the second example, you have to make 2 successful and 8 unsuccessful submissions. Your success rate will be equal to  $9 / 24$ , or  $3 / 8$ .

In the third example, there is no need to make any new submissions. Your success rate is already equal to  $20 / 70$ , or  $2 / 7$ .

In the fourth example, the only unsuccessful submission breaks your hopes of having the success rate equal to  $1$ .