D. Same GCDs

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

You are given two integers a and m. Calculate the number of integers x such that $0 \le x < m$ and $\gcd(a, m) = \gcd(a + x, m)$.

Note: $\gcd(a, b)$ is the greatest common divisor of a and b.

Input

The first line contains the single integer T ($1 \le T \le 50$) — the number of test cases.

Next T lines contain test cases — one per line. Each line contains two integers a and m ($1 \le a < m \le 10^{10}$).

Output

Print T integers — one per test case. For each test case print the number of appropriate x-s.

Example

input	Copy
3 4 9 5 10 42 9999999967	

output	Copy
6 1 9999999966	

Note

In the first test case appropriate x-s are $[0, 1, 3, 4, 6, 7]$.

In the second test case the only appropriate x is 0.