Casino Floor | Advanced Division

Problem D: Reciprocal Roulette

Base Program Constraints: 1s, 256 MB

Clear Reward: +1 Point

Stanley *might* be the reason why the PHS Computer Team is now in crippling debt — but hey, it's not every day you get to visit the Cardinal Casino. Why not enjoy the various games? As long as he doesn't gamble away *too* much money, he'll be fine, and it'll make him look like a convincing customer. At least, that's what he's telling himself...

After some close observation, Stanley notices an interesting pattern with the casino's roulette wheel, which has n slots in a **circular pattern** numbered from 0 to $n-1$. Every spin, the number of the slot the ball lands in is x **more** than the result of the last spin, **modulo** n. Formally, if the ball lands in slot a after a spin, then the ball will land in slot $(a+x)$ mod n on the next spin.

Stanley notes that, as a result of this pattern, some **unlucky** slots on the roulette wheel are **never landed in**. He wants to know how many **unlucky** slots are on the roulette wheel so he can avoid betting on them. Can you help Stanley out?

Input

Each test contains multiple test cases. The first line of input contains the number of test cases t $(1 \leq t \leq 100)$.

The first and only line of each test case contains two integers n and x $(2 \leq n \leq 10^{15}, 1 \leq x \leq n)$. Note that the starting position of the ball is unknown.

Output

For each test case, output a single integer - the number of unlucky spots on the roulette wheel.

Sample Test Cases

Sample 1 - Input

```
5
5 1
10 2
30 4
30 7
1000000000000000 1
```

Sample 1 - Output

```
0
5
15
0
0
```

Notes

In the first test case, the ball will eventually land in every slot from 0 to 4.

In the second test case, if the ball starts in an odd slot, it will never land in an even-numbered slot. If the ball starts in an even slot, it will never land in an odd-numbered slot. In both cases, there are 5 unlucky slots that the ball will never land in.