(B)The Password

Description

Before departure, Mr. Le wants to buy a bunch of flowers. Unfortunately, he forgot the password of his Alipay account. The good news is that Mr. Le and Ms. Y made an appointment earlier when they set their passwords *x* and *y*, requiring them to satisfy $x \cdot y \equiv 520 \ (mod\ n)$, where *n* is called the lucky number. Mr. Le knows Ms. Y's password *y* like some other lovers. As it has been a long time since he finished CS3391, Mr. Le's forgotten how to compute his password x according to the known message. Could you help him to figure it out? By the way, the password is the minimum possible natural number.

Input

The first line is the number *T* – the number of test cases (T≤50000). Then T lines follow, with each of them containing two integers: *y n (521* $\leq y \leq n \leq 2^{63}$*-1).*

Output

For each test case, print the password of Mr. Le. It is guaranteed that the answer must exist.

Example

Input	Output
1 647 1024	952