The Secret Key

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1.5 seconds
Memory limit:	256 megabytes

Kalu is a computer engineer working for an agency that needs to send and receive encrypted messages. The agency has given him a transmitter that contains a special number A and a receiver that contains a special number B. These two devices need to communicate with each other securely using a shared secret, which is an integer X.

The shared secret X must satisfy two properties:

- When you divide the transmitter's number A by X, the remainder is m_1.
- When you divide the receiver's number B by X, the remainder is m_2.

Your job is to write a program that finds the **smallest positive** integer X that satisfies these properties.

Note: When dividing the integer a by the integer b, the remainder is a unique integer c satisfying $0 \leq c < b$ and the property that $a - c$ is divisible by b.

Input

The first line of input consists of an Integer T ($1 \leq T \leq 5 \cdot 10^5$) denoting the number of test cases. Each of the following T lines contains four integers separated by a space: A, B, m_1, and m_2 ($1 \leq A, B \leq 5 \cdot 10^5$, $0 \leq m_1, m_2 \leq 5 \cdot 10^5$).

Output

For each test case, print the secret key X if it exists. Otherwise, print -1.

Example

standard input	standard output
3 2 4 0 0 3 6 1 0 10 10 2 6	1 2 -1