Problem 6 | **60 Points**

Passing Notes

Program Name: notes.java **Input File: notes.in**

A summer camp has recently decided to try a new ice breaker activity to help get its 100 attendees to know each other better. It involves breaking the campers up into groups to play games, then changing the groups and playing another game, and continuing to change groups and play games until the camp counselors are ready to do something else.

Two of the campers are sweethearts, and one wants to pass a note to the other as quickly as possible without the counselors noticing. A person with a note can pass it to anyone in their current group, and the person holding the note when groups are changed will carry the note to their new group. Groups change every 5 minutes, so write a program that can determine the minimum amount of time required to pass the note between the two sweethearts.

Fortunately, you know the algorithm that determines the way the counselors divide up the campers. First, each camper is assigned a number from 1 to 100. Then the counselors generate a list of numbers that will be used to divide up the groups. They refer to the first number to create the first set of groups by putting together campers whose assigned number has the same remainder when divided by the number from the list. For instance, if the first number of the counselors' list was 3, then there would be 3 groups. One group would contain all campers whose assigned numbers divide 3 evenly (3, 6, 9, 12, etc.), one group would be for those where the remainder was 1 (i.e., 1, 4, 7, 10, etc.), and the third group would be for those where the remainder was 2 (i.e., 2, 5, 8, 11, etc.). After 5 minutes, the counselors look at the next number on their list and then have the campers form new groups.

Input

The first line of input will contain a single integer, *n*, indicating the number of data sets to process. The remainder of the input consists of those *n* data sets.

Each data set will be a single line containing 12 positive integers. The first indicates the number assigned to the note writer, and the second is the number of his/her sweetheart. The remaining 10 integers make up the counselor's list used to create the groups.

Output

For each data set in the input, print a single line indicating the minimum number of minutes from the time of the first grouping to pass the note to the writer's sweetheart. Format the output as, "x minutes".

You can assume that the note will always, eventually, reach its destination.

Example Input File

```
3
1 100 10 3 5 5 5 5 5 5 5 5
18 27 1 2 3 4 5 6 7 8 9 10
4 71 50 10 2 8 16 72 70 100 3 2
```

Example Output To Screen

```
5 minutes
0 minutes
40 minutes
```