

Round B APAC Test 2016

[A. Travel](#)

B. gWheels

[C. gNumbers](#)

[D. Albocede DNA](#)

[Questions asked](#)

Submissions

Travel	
6pt	Not attempted 503/1288 users correct (39%)
12pt	Not attempted 365/493 users correct (74%)
gWheels	
5pt	Not attempted 1062/1588 users correct (67%)
14pt	Not attempted 244/873 users correct (28%)
gNumbers	
8pt	Not attempted 259/1020 users correct (25%)
16pt	Not attempted 78/181 users correct (43%)
Albocede DNA	
16pt	Not attempted 31/139 users correct (22%)
23pt	Not attempted 18/23 users correct (78%)

Top Scores

kcm1700	100
LeeSin	100
johngs	100
Taradheesh	100
Eyelids	100
BrianKuo	100
huangxi	100
sgtlaugh	100
yaray	84
alecsyde	84

Problem B. gWheels

This contest is open for practice. You can try every problem as many times as you like, though we won't keep track of which problems you solve. Read the [Quick-Start Guide](#) to get started.

Small input
5 points

Solve B-small

Large input
14 points

Solve B-large

Problem

A typical mountain bike has two groups of gears: one group connected to the pedals, and one group connected to the rear tire. A gear group consists of many gears, which usually have different numbers of teeth. A chain connects one of the gears in the pedal gear group to one of the gears in the tire gear group, and this determines the ratio between the cyclist's pedaling speed and the tire speed. For example, if the chain connects a gear with 5 teeth on the pedals to a gear with 10 teeth on the tires, the ratio will be $1/2$, since the cyclist needs to make the pedal gear rotate twice to make the tire rotate once. The cyclist can change the chain to connect any one gear from the pedal group to any one gear from the tire group.

You have just bought a special new mountain bike with *three* groups of gears: one connected to the pedals, one connected to the tire, and one extra group in between. This mountain bike has two chains; the first chain must always connect one gear from the pedal gear group to one gear on the extra gear group, and the second chain must always connect one gear from the extra gear group to one gear on the tire gear group. Moreover, the two chains cannot both use the same gear from the extra gear group.

Given the numbers of teeth on the available gears on the pedals, extra, and tire groups, is it possible to make the ratio (between pedaling speed and tire speed) be exactly P/Q ? For a given set of gears, you may need to answer multiple such questions.

Input

The first line of the input gives the number of test cases, T . T test cases follow. Each begins with one line with 3 integers N_p , N_e , and N_t , representing the numbers of gears on the pedals, extra, and tire groups. Then, three more lines follow. These contain N_p , N_e , and N_t integers, respectively, representing the numbers of teeth on the different gears on the pedals, extra, and tire gear groups, respectively. (It is guaranteed that the numbers of teeth on the gears within a group are all distinct.) The next line after that consists of one integer, M , the number of questions. Finally, there are M lines, each with 2 integers, P and Q , representing the target ratio. (It is not guaranteed that this ratio is a reduced fraction.)

Output

For each test case, first output one line containing "Case #x:", where x is the test case number (starting from 1). Then output one line for each question within the test case, in the order that the questions were presented: Yes if it's possible to make the ratio P/Q , and No if it's impossible.

Limits

$1 \leq T \leq 100$.
 $1 \leq$ the number of teeth on each gear ≤ 10000 .
 $1 \leq$ all values of P , $Q \leq 10^9$.
 $1 \leq M \leq 10$.

Small dataset

$1 \leq N_p, N_t \leq 10$.
 $2 \leq N_e \leq 10$.

Large dataset

$1 \leq N_p, N_t \leq 2000$.
 $2 \leq N_e \leq 2000$.

Sample

Input	Output
1	Case #1:
1 2 3	No
5	Yes

```
4 6
3 5 7
2
1 1
5 2
```

For the first question in the test case, it's impossible to get the ratio 1/1 since this would require both chains to be on the same gear in the extra gear group, which is not allowed.

For the second question in the test case, you can make the first chain connect the 5-tooth gear on the pedal gear group to the 4-tooth gear on the extra gear group, and make the second chain connect the 6-tooth gear on the extra gear group to the 3-tooth gear on the tire gear group. With this setup, the ratio is 5/2.

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