

Speed test - Cube version

This problem was created to compare speed of the [Pyramid and Cube Clusters](#). After you get AC result for this problem you can submit solution to problem called [Speed test - Pyramid version](#) - both problems have identical statement and test cases.

Input

There is a single positive integer t ($2 \leq t \leq 10000$) on the first line of input which corresponds to the number of tests. Then t lines follow, each containing five numbers: a, b, c, d, h ($2 \leq a, b, c, d, h \leq 10000$). For each line you should do the following thing:

Step 0

a) Assign a to $r1$.

Step 1

b) Take $r1$, add b to it and you get $r2$.

c) Take $r2$, multiply it by c and you get $r3$.

d) Now compute $r1 = r3$ modulo d .

Steps 2, 3, ..., h

e) Do b), c) and d) ($h-1$) times.

Output

t lines containing one number: $r1$

Example

Input:

```
3
2 3 4 5 2
5 8 9 4 9
23 15 923 489 23
```

Output:

```
6
5
284
```