Problem E. Find Maximum

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 megabytes

We define a function $f(x)$ over all non-negative integer x as follows:

$$f(x) = \begin{cases} 1 & (x = 0) \\ f(\frac{x}{3}) + 1 & (x > 0 \wedge x \bmod 3 = 0) \\ f(x-1) + 1 & (x > 0 \wedge x \bmod 3 \neq 0) \end{cases}$$

Calculate $\max_{x=l}^{r} f(x)$.

You need to answer T queries independently.

Input

The first line contains a single integer T ($1 \leq T \leq 10^4$).

Each of the next T lines contains two integers l and r ($1 \leq l \leq r \leq 10^{18}$), representing a query.

Output

Output T lines. The i-th line contains a single integer, representing the answer to the i-th query.

Example

standard input	standard output
10 1 2 1 3 1 4 1 5 2 3 2 4 2 5 3 4 3 5 4 5	3 3 4 5 3 4 5 4 5 5