Spell Generation

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

Hiding various taboo words in a string to achieve the effect of a spell is a common phenomenon in the magical world. To better cope with cases of illegal spell usage, the people of this country need to learn spellcraft to help themselves defend against spells.

Today's lesson is about a simple spell generator, which has two modes: **Click** and **Press**.

For each click, it takes 1 second to generate a spell of length 1.

For each press, you must first choose a positive integer x, and then it takes 2^x seconds to generate a spell of length 10^x.

Now you are given some lengths of spells that need to be generated, and you need to calculate the minimum time required to generate each spell.

Input

The first line contains an integer T ($1 \leq T \leq 50000$), representing the total number of requests.

Each of the following lines contains an integer r ($1 \leq r \leq 10^{18}$), representing the length of each spell to be generated.

Output

Output T lines, each line representing the minimum time required.

Example

standard input	standard output
5 23 61 62 114514 1919810	7 13 14 106 474