Problem A
Factoring Integers

Let n be an odd integer greater than 2. Write a program to repeatedly simulate the randomized algorithm (Monte Carlo algorithm) for factoring n:

1. randomly select an integer p.
2. **if** $(1 < \gcd(n, p) < n)$ print p **else** fail.

In the i-th simulation, the "random number" p_i should be computed by the following formula.

$$p_i = \begin{cases} 3 & \text{if } i = 1, \\ n - p_{i-1} & \text{if } i > 1 \text{ and } i \text{ is even}, \\ (3 + 5p_{i-1}) \bmod n & \text{if } i > 1 \text{ and } i \text{ is odd}. \end{cases} \quad (1)$$

The simulation stops when one of the following conditions occurs.

1. The integer n has been successfully factored, or
2. All the distinct "random numbers" described by Equation 1 have been tested.

Input Format

The first line of the input contains a positive integer m ($m < 40$) indicating the number of test cases that follows. Each test case contains an integer n in a line, where $2 < n < 2^{31}$.

Output Format

For each test case, print out the following in a line.

`n = P * Q`

In the above output, `P` is the $\gcd(n, p_i)$, and `Q`$= n/$`P`. If the given integer n is prime or it cannot be factored by the method described above, then print the following line.

`n = 1 * n`

Print exactly 1 space before and after the symbols "=" and "*".

Sample Input

```
3
221
187
13
```

Output for the Sample Input

```
221 = 13 * 17
187 = 11 * 17
13 = 1 * 13
```