474 Heads / Tails Probability

The probability of n heads in a row tossing a fair coin is 2^{-n}. Calculate the probability for any positive integer n ($1 \leq n \leq 1000000$).

Input

A list of valid values of n (one per line).

Output

Print a table of n and 2^{-n} in the following for the given values of n, using the following format:

```
2^-n = z.xxxe-y
```

where `z` is a nonzero decimal digit, each `x` is a decimal digit and each `y` is a decimal integer with no leading zeros or spaces.

Sample Input

```
1
100
10000
1000000
```

Sample Output

```
2^-1 = 5.000e-1
2^-100 = 7.889e-31
2^-10000 = 5.012e-3011
2^-1000000 = 1.010e-301030
```