545 Heads

The probability of n heads in a row tossing a fair coin is 2^{-n}

Input

r lines containing each one an integer number n. The values of r and n are as follows: $0 < r < 10$, $0 < n \leq 9000$.

Output

Print r lines each with the value of 2^{-n} for the given values of n, using the format:

`2^-`n` = x.xxxE-`y

where each x is a decimal digit and each y is a decimal integer with no leading zeroes or spaces.

Sample Input

```
8271
6000
1
```

Sample Output

```
2^-8271 = 1.517E-2490
2^-6000 = 6.607E-1807
2^-1 = 5.000E-1
```