

Funny Bits

time limit per test: 0.5 seconds
memory limit per test: 128 megabytes
input: standard input
output: standard output

points: 100 · problem code: funnybits · author: kahootist

Problem Statement

Let a be the average (rounded down) of all positive integers up to k -bits with n bits set.
(A bit is "set" if it equals one. For example, in the binary number 1101, there is a total of 3 bits set.)
Given k and a , find n .

Input

Your only line of input will contain two space-separated integers, k and a .

Output

One line, containing only the number n .

Constraints

For all test cases:

- $1 \leq k \leq 30$
- $1 \leq a \leq 10^{10}$
- There will always be a unique valid n for the given k and a .

Sample Test Cases

Example 1

Input

4 7

Output

2

Explanation

If we let $n = 2$, then there are a total of 6 integers (3, 5, 6, 9, 10, 12) that can be represented with at most $k = 4$ bits with exactly $n = 2$ bits set:

```
3 = 0011
5 = 0101
6 = 0110
9 = 1001
10 = 1010
12 = 1100
```

The average of these numbers is 7.5, which rounds down to 7. Thus, $n = 2$.

Example 2

Input

3 2

Output

1

Explanation

If we let $n = 1$, then there are a total of 3 integers (1, 2, 4) that can be represented with at most $k = 3$ bits with exactly $n = 1$ bit set:

1 = 001

2 = 010

4 = 100

The average of these numbers is 2.33, which rounds down to 2. Thus, $n = 2$.

Example 3

Input

7 90

Output

5

Explanation

If we let $n = 5$, then there are a total of 21 integers that can be represented with at most $k = 7$ bits with exactly $n = 5$ bits set. These numbers sum to 1905 and averages to 90.71, which rounds down to 90. Thus, $n = 5$.