

Problem L Maximum

Input File: L.IN

Output File: L.OUT

Let x_1, x_2, \dots, x_m be real numbers satisfying the following conditions:

a) $-1/\sqrt{a} \leq x_i \leq \sqrt{a}$;

b) $x_1 + x_2 + \dots + x_m = b \cdot \sqrt{a}$

for some integers a and b ($a > 0$).

Determine the maximum value of p

$$x_1^p + x_2^p + \dots + x_m^p$$

for some even positive integer p .

Each input line contains four integers: m, p, a, b ($m \leq 2000, p \leq 12, p$ is even).

Input is correct, i.e. for each input numbers there exists x_1, x_2, \dots, x_m satisfying the given conditions.

For each input line print one number – the maximum value of expression, given above. The answer must be rounded to the nearest integer.

Input

1997 12 3 -318

10 2 4 -1

Output

189548

6