2911 - Maximum

Europe - Southeastern - 2006/2007

Let $x_1, x_2, ..., x_m$ be real numbers satisfying the following conditions:

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

b) $x_1 + x_2 + ... + x_m = b * \sqrt{a}$ for some integers a and b ($a > 0$).

Determine the maximum value of $x^p_1 + x^p_2 + ... + x^p_m$ for some even positive integer p.

Input

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 $x_1, x_2, ..., x_m$ satisfying the given conditions.

Output

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

Sample Input

```
1997 12 3 -318
10 2 4 -1
```

Sample Output

```
189548
6
```

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