

2911 Maximum

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

- a) $-\frac{1}{\sqrt{a}} \leq x_i \leq \sqrt{5}$;
- b) $x_1 + x_2 + \dots + x_m = b * \sqrt{a}$ for some integers a and b ($a > 0$).

Determine the maximum value of $x_1^p + x_2^p + \dots + x_m^p$ 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, \dots, 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

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

Sample Output

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189548
6
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