

Square Kingdom

Input file: **standard input**
Output file: **standard output**
Time limit: 4 seconds
Memory limit: 1024 megabytes

In the Square Kingdom, n residents numbered from 1 to n live alone on top of a tall stone pillar. The height of the pillar for the i -th resident is $(i + \frac{b}{a})^2$ units above the ground.

Since everyone lives so high up, the only way to visit a neighbor is by using a ladder. The kingdom builds one ladder for every pair of residents. The length of each ladder is exactly the absolute difference in height between the two pillars it connects.

With $\frac{n(n-1)}{2}$ ladders in total, it becomes hard to manage them all. You are asked for the length of the k -th ladder in ascending order of length. This information will help the kingdom plan repairs, deliveries, and community events.

Input

The only line contains four integers n ($2 \leq n \leq 10^{12}$), k ($1 \leq k \leq \min\{\frac{n(n-1)}{2}, 10^{12}\}$), a ($1 \leq a \leq 10^6$), and b ($0 \leq b \leq 10^{12}$).

Output

Output a line containing two integers p and q , denoting that the length of the k -th ladder in ascending order of length can be represented as $\frac{p}{q}$ with two integers p and q ($p \geq 0$, $q \geq 1$, $\gcd(p, q) = 1$), where $\gcd(p, q)$ is the greatest common divisor of p and q .

Examples

standard input
3 1 3 1
standard output
11 3
standard input
3 2 3 1
standard output
17 3
standard input
3 3 3 1
standard output
28 3
standard input
1414215 1000000000000 1000000 1000000000000
standard output
4823373069559 1