Project Euler #210: Obtuse Angled Triangles

This problem is a programming version of Problem 210 from projecteuler.net

Consider the set $S(r)$ of points (x, y) with integer coordinates satisfying $|x| + |y| \leq r$.

Let a, b, n, r be natural numbers and let A be the point $(\frac{a}{b}, \frac{a}{b})$ and B the point $(2n - \frac{a}{b}, 2n - \frac{a}{b})$.

Let $N(r, a, b, n)$ be the number of points C in $S(r)$, so that the triangle ABC has an obtuse angle, i.e. the largest angle α satisfies $90^\circ < \alpha < 180^\circ$.

So, for example, $N(8, 0, 1, 1) = 100$.
Given a, b, n and r, what is $N(r, a, b, n)$?

Input Format

The only line of the input contains exactly three space-separated integers: r, a, b, n.

Constraints

- $1 < r \leq 10^9$.
- $b > 0$.
- The points A and B both lie within $S(r)$.

Output Format

Print one line containing the answer.

Sample Input 0

```
8 0 1 1
```

Sample Output 0

```
100
```

Sample Input 1

```
17 3 7 2
```

Sample Output 1

```
486
```

Sample Input 2

```
15 -13 10 1
```

Sample Output 2

```
364
```

Sample Input 3

```
17 -5 13 3
```

Sample Output 3

```
438
```