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 $|x| + |y| \leq r$.

Consider three integers a, b, n 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 $\mathbf{ABC}$ has an obtuse angle, i.e. the largest angle α satisfies $90^\circ < \alpha < 180^\circ$.

Given r, a, b and n, what is $N(r, a, b, n)$?

Input Format

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

Constraints

- $2 \leq r \leq 10^9$.
- $|a| \leq r$.
- $0 < b \leq r$.
- $0 \leq n \leq r$.
- $2|\frac{a}{b}|, 2|2n - \frac{a}{b}| \leq r$.
- $|n - \frac{a}{b}| \leq 3 \times 10^8$.
- $n \times b > a$.

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
```