Finding roots 1

We love linear functions and trigonometric functions. So I made a new function

$$f(x) = Ax + B\sin x + C\cos x$$

where A, B, C are fixed **non-negative** integer constants that are given to you.

We also love obtuse triangles, so $\boldsymbol{A^2 > B^2 + C^2}$ is always true.

With these conditions, it is guaranteed that for all $D \in \mathbb{R}$, there exists exactly one x_0 such that $f(x_0) = D$. In other words, there exists exactly one root of the equation $f(x) = D$.

Given A, B, C and D, please write a program that finds the root of the equation $f(x) = D$. To make x non-negative, it is guaranteed that $\boldsymbol{D \geq C}$.

Input

Your input consists of an arbitrary number of lines, but no more than 1,000.

For each input line, four space-separated integers A, B, C, D $(0 \leq A, B, C \leq 100,\ C \leq D \leq 10{,}000,\ A^2 > B^2 + C^2)$ are given.

The end of input is indicated by a line containing only the value -1.

Output

For each input line, print the root of the equation $f(x) = D$. The root should be truncated to a multiple of 0.001, and formatted to three digits after the decimal period. The order of output should be the same as the input.

Notes

You can calculate $f(x)$ using the code below:

```c
#include <math.h>

double f (double x) {
    return A * x + B * sin(x) + C * cos(x);
}
```

Example

Standard input	Standard output
3 0 0 100 1 1 0 100 2 1 1 1 2 1 1 7 -1	33.333 100.263 0.000 4.183

Time Limit

1 second.