Granny is preparing moonshine whiskey for an upcoming family reunion. Because her family is large, she needs to make several batches of whiskey, which she collects in a large metal cream can. After making, and sampling, several batches Granny stumbles and knocks the can on its side. Fortunately, the lid is tightly fixed so no whiskey is lost.

Our question to you is this: assuming that the depth of whiskey in the can was k cm with the can sitting upright, what is its depth with the can lying horizontal? The can itself is made of two cylinders: the body with height h_b and diameter d_b, and the neck with height h_n and diameter d_n. The neck and body are joined by a tapered conic shoulder such that the overall height of the can is h. The bottom and lid of the can are disks of diameter d_b and d_n respectively.

Input

Input consists of several test cases. Each test case consists of a line containing real numbers k h_b d_b h_n d_n and h. You may assume that $100 \geq h \geq h_b + h_n$ and that $100 \geq d_b \geq d_n$.

A line containing '0 0 0 0 0 0' follows the last test case.
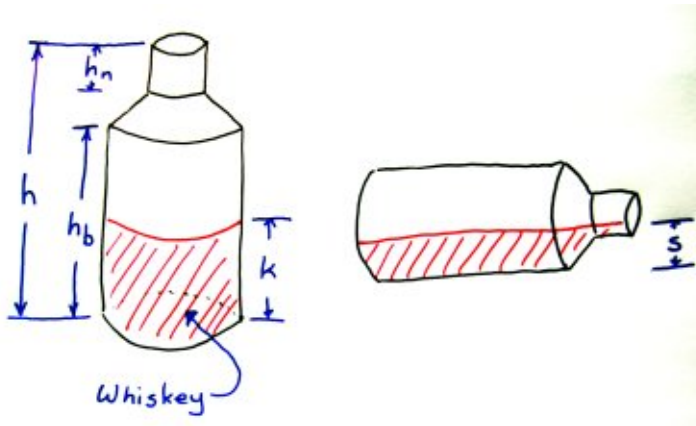
Output

For each test case, output a line containing s the depth with the can lying horizontally, rounded to two decimal places.

Sample Input

```
5.625 10.0 10.0 5.0 5.0 15.0
0 0 0 0 0 0
```

Sample Output

```
5.00
```