

# The Rolling Ball

A solid spherical ball of radius  $R$  rolls without slipping on the inside surface of a fixed cone, whose tip points downward. The half-angle at the vertex of the cone is  $u$ . Initial conditions have been set up so that the ball travels around the cone in a horizontal circle of radius  $l > R$ , with the points on the ball that touch the cone tracing out a circle on the ball.

Determine the radius of the circle of these contact points, if you want the sphere to travel around the cone as fast as possible.

## Input

Each line of input has integers  $l$  ( $R < l \leq 1000000$ )  $R$  ( $0 < R \leq 1000$ ) and  $u$  ( $0 < u < 90$ ) given in degrees.

## Output

For each line of input, output the radius of the circle of the contact points, round to integer.

## Example

**Input:**

220000 100 29

**Output:**

46

Problemsetter --- Wu, Xiaogang