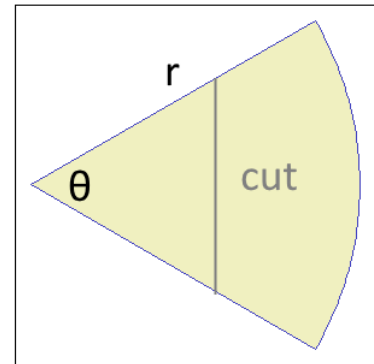


Problem F

Pizza Cutting

Wen is going to share a slice of pizza with Modan, and he wants to split the slice into two parts of equal area. A slice of pizza is a circular sector with radius r and angle θ . A “normal cut” to split the pizza evenly would be a cut from the middle of the arc to the center of the circle. Modan doesn’t like the “normal cut”, instead he wants to make a cut perpendicular to the “normal cut” yet still splitting the pizza evenly. However, Wen found it’s much more difficult to determine where this cut should be made. Write a program to help Wen find where to cut the pizza!



Input

The test file starts with an integer T ($T \leq 1000$), the number of test cases. Each test case consists of a single line with two real numbers r ($0 < r \leq 1000$), the radius of the slice, and θ ($0 < \theta < \pi/2$), the angle in radians.

Output

For each test case, output the distance between the center of the cut and the center of the circle. Your answer will be considered correct if its absolute or relative error doesn’t exceed 10^{-6} .

Sample Input	Sample Output
2	32.0490630280
45.4 0.2	30.7120826080
45.4 1	