HANGZHOU DIANZI UNIVERSITY Online Judge

Online Judge	Online Exercise	Online Teaching	Online Contests	Exercise Author
F.A.Q	Problem Archive	C/C++/Java Exams	Best Coder beta	SHawnHardy
Hand In Hand	Realtime Judge Status	ACM Steps	VIP | STD Contests	Mail 0(0)
Online Acmers	Authors Ranklist	Go to Job	Virtual Contests	Control Panel
Forum | Discuss	Search	Contest LiveCast	DIY | Web-DIY beta	Sign Out
Statistical Charts		ICPC@China	Recent Contests	

Goddess

Time Limit: 20000/10000 MS (Java/Others)   Memory Limit: 32768/32768 K (Java/Others)
Total Submission(s): 789   Accepted Submission(s): 137
Special Judge

Problem Description

Goddess used to be a good friend of Jitui, but Jitui has always been busy solving algorithm problems which makes Goddess very upset. In order to punish Jitui, Goddess will send N spaceships to attack Jitui's LAB (Lost Algorithm Base). Jitui's LAB is going to use laser weapons to destroy some of the spaceships.

The whole space can be seen as a two-dimensional coordinate system. Jitui's LAB is a single point located at $(0, 0)$. Each spaceship can be considered as a circle with center at (x_i, y_i) and radius r_i. Laser weapon can be viewed as a ray starting from $(0, 0)$, and in a direction chosen by Jitui. For each spaceship, the sum of length of segments that covered by the ray is the total damage made by the laser. Note that spaceships may overlap, which means the length that the laser weapon covers each spaceship may be calculated more than once. Jitui wants you to help him calculate the maximum damage he can make.

The number of spaceships N will not exceed 200. All centers of spaceships are guaranteed to be in the square with the left-down point at $(-1000, -1000)$ and the right-up point at $(1000, 1000)$. No spaceship will cover the point of $(0, 0)$.

Input

There are several test cases. Please process till EOF.

For each case, the first line contains a number N that denotes the number of spaceships. Then next N lines, i-th line contains three numbers x, y, r denotes the coordinate of the center (x and y) and radius (r) of the i-th spaceship.

Output

For each case, output the maximized damage made by Jitui's laser weapon.

Your output will be considered correct if within an absolute error less than 10^{-6}.

Sample Input

```
1
50 0 10
2
30 0 10
60 20 20
```

Sample Output

```
20.0000000000
53.0366762251
```

Source

2014西安全国邀请赛

Recommend

liuyiding | We have carefully selected several similar problems for you: 6193 6192 6191 6190 6189