The area of the union of circles

You are given N circles and expected to calculate the area of the union of the circles !

Input

The first line is one integer n indicates the number of the circles. (1 <= n <= 1000)

Then follows n lines every line has three integers

Xi Yi Ri

indicates the coordinate of the center of the circle, and the radius. (|Xi|. |Yi| <= 1000, Ri <= 1000)

Note that in this problem Ri may be 0 and it just means one point !

Output

The total area that these N circles with 3 digits after decimal point

Example

Input:
3
0 0 1
0 0 1
100 100 1

Output:
6.283