Problem A. Circular Sectors

Input file:	standard input
Output file:	standard output
Time limit:	2 seconds
Memory limit:	256 megabytes

Bobo has drawn n circular sectors on the plane. He would like to know the area of the union of all the circular sectors.

Input

The input contains zero or more test cases, and is terminated by end-of-file. For each test case:

The first line contains an integer n, the number of circular sectors ($1 \leq n \leq 500$).

Each of the next n lines contains five numbers x_i, y_i, r_i, s_i and θ_i ($-100 \leq x_i, y_i \leq 100$, $1 \leq r_i \leq 100$, $0 \leq s_i \leq 6$, $0.1 \leq \theta_i \leq 6$). Here, (x_i, y_i) is the coordinate of the circle center, r_i is the radius of the circle, s_i is the starting angle in radians (counter-clockwise from the positive direction of the x axis) and θ_i is the central angle in radians (this means that the sector arc goes from angle s_i to angle $s_i + \theta_i$ where the angle is measured counter-clockwise from the positive direction of the x axis). Also, x_i, y_i and r_i are integers, and s_i and θ_i are real numbers with exactly 3 digits after the decimal point.

It is guaranteed that the sum of n does not exceed 500.

Output

For each test case, output a real number denoting the answer. Your answer will be considered correct if its relative or absolute error doesn't exceed 10^{-6}.

Example

standard input	standard output
2	35.80050000000000700000
-3 -5 5 0.705 0.217	1.12999999999999940000
-5 1 4 3.070 4.136	106.44493143870359000000
1	
-4 -4 1 0.485 2.260	
3	
4 4 4 4.266 4.673	
2 -4 5 0.353 5.565	
-2 1 3 3.974 0.207	

Note

The image below shows the third test case.