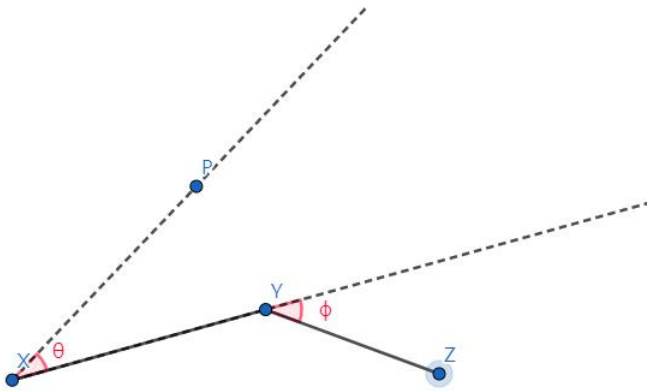
Problem G. Paddle Star

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	1024 megabytes

Putata is fascinated with playing Zoe these days. Putata is practicing Zoe's ability, paddle star at this moment.

This ability allows Zoe to fire a star that she can redirect in flight. The damage dealt by the star is positively correlated to its flying distance. Formally, assume Zoe is currently at point X and she fires in any direction. At any moment, Zoe can change the direction of the star. If the star is at point Y, and the new direction leads to some point Z, then the track of the star will be $X \to Y \to Z$. If the star meets any enemy on its trace, it will immediately disappear and cause damage to the enemy.

Since Putata is not skilled enough to control this ability, the stars he fires always fit the following restrictions. The first segment XY always has length l_1, and the second segment YZ always has length l_2. Assume Zoe is facing direction $\vec{XP}$ (which is a certain direction), and let $\langle \vec{XP}, \vec{XY} \rangle$ be θ degrees, $\langle \vec{XY}, \vec{YZ} \rangle$ be ϕ degrees, then $\theta \in [-\alpha, \alpha]$ and $\phi \in [-\beta, \beta]$. You can refer to the following picture to help you understand.



Putata's rival, Budada, wants to know the total area that could possibly be attacked by Putata's Zoe. However, Budada is busy with math problems, so he wants you to help him solve this problem.

Input

The first line contains one integer T ($1 \le T \le 10^5$), the number of test cases.

For each test case output one line contains four integers l_1, l_2, α and β ($1 \le l_2 \le l_1 \le 10^9$, $0 \le \alpha \le 90$, $0 \le \beta < 180$), indicating the attributes of the ability.

Output

Print one line for each test case, each line contains one real number, indicating the answer.

Your answer will be considered correct if its absolute or relative error does not exceed 10^{-6}. Formally, let your answer be a, and the jury's answer be b. Your answer will be considered correct if $\frac{|a-b|}{\max(1,|b|)} \le 10^{-6}$.

Example

standard input	standard output
5 2 1 20 20 3 3 0 0 20 20 90 120 20 10 50 170 100 10 1 93	3.490658503988659 0.000000000000000 3367.157611906510738 1098.863278984081717 373.960489570087645