Elon's Eagle

Your lunatic friend Elon has a strange temptation that he ~~musk~~ must travel through interstellar space in the hope of finding habitable planets. He has already identified n stars that can recharge his spaceship ~~Falcon~~ Eagle via its solar panels. The only work left is to decide the orientation of the spaceship that maximizes the distance it can travel.

Space is modeled as a 2D plane, with the Earth at the origin. The spaceship can be launched from the Earth in a straight line, in any direction. Star i can provide enough energy to travel t_i distance if the spaceship is launched at an angle of a_i radians with the x-axis.

If the angle is not perfectly aligned, then the spaceship gets less energy. Specifically, if the launch direction makes an angle of a with the x-axis, then from star i it gets enough energy to travel distance of

$$\max(0, t_i - s_i \cdot \text{dist}(a_i, a)),$$

where $\text{dist}(a, b)$ is the minimum radians needed to go from angle a to b. The distance that the spaceship can travel is simply the sum of the distances that each star contributes.

Find the maximum distance T that the starship can travel.

Input

The first line contains the value n, where $1 \leq n \leq 100\,000$.

Following this are n lines each containing three real numbers t_i, s_i, and a_i, with $0 < t_i \leq 1\,000$, $0 \leq s_i \leq 100$, and $0 \leq a_i < 2\pi$.

All real numbers in the input have at most 6 digits after the decimal point.

Output

On a single line output the maximum distance the spacecraft can travel. Your answer is considered correct if it has an absolute or relative error of at most 10^{-6}.

Examples

input	output
2 100 1 1 100 1 1.5	199.500000
4 100 1 0.5 200 1 1 100 0.5 1.5 10 2 3	405.500000