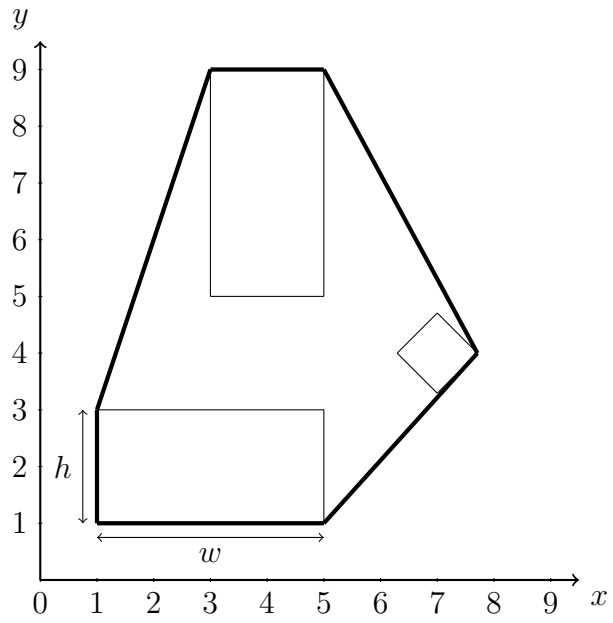
Problem 4: Massive Mission

Time limit : 1s
Memory limit: 256MB

After several days being repelled by the Galicia-Volyn Army, the Red Special Forces had decided to change their military strategy. Aerial bombing was chosen and the location will be the K-Complex. As a result, an investigation was held and some important information was collected.

Suppose that we are considering the map of the K-Complex on the 2D space. The K-Complex consists of n rectangular buildings. Each one is described by five integers x, y, w, h and ϕ. Two numbers x and y are coordinates of the building center on the 2D map, w and h one-by-one are its width and height, ϕ, in degree, is the angle between the height axis of the building to the Oy axis, positive clockwise.

To protect the K-Complex, the Galicia-Volyn Army has built The Great Hull, which includes several walls. The walls are surrounding the buildings of K-Complex and are built to minimize the area it is covered in. As a result, the shape of The Great Hull is a Convex Hull (that's why it has 'Hull' in its name).



The area which inside The Great Hull is consider the part of The K-Complex and otherwise. Moreover, to make the bombing campaign more preciously, Hien, the commander of the Red Special Forces wants to know the percentage of space occupied by the buildings to the total space of the K-Complex.

Input

The very first line of the input contains an integer t $(1 \leq t \leq 10)$, the number of test cases.

Each test case starts with an integer n $(1 \leq n \leq 600)$, the number of buildings in the K-Complex. For each building, five integers x, y, w, h, ϕ $(0 \leq x, y, w, h \leq 10^4, -90 \leq \phi \leq 90)$ are given as described above. Remember that ϕ is given in degrees. It is guaranteed that the buildings will not be overlapped.

Output

For each test case, print a single real number p in a single line, the percentage of space occupied by the buildings to the total space of the K-Complex, with exactly two numbers after the decimal point.

Sample Input	Sample Output
1 3 3 2 4 2 0 4 7 4 2 90 7 4 1 1 45	46.16

Note: The sample input is the case which is illustrated in the problem statement above.