Problem G. The Mountain

All as we know, a mountain is a large landform that stretches above the surrounding land in a limited area. If we as the tourists take a picture of a distant mountain and print it out, the image on the surface of paper will be in the shape of a particular polygon.

From mathematics angle we can describe the range of the mountain in the picture as a list of distinct points, denoted by (x_1, y_1) to (x_n, y_n). The first point is at the original point of the coordinate system and the last point is lying on the x-axis. All points else have positive y coordinates and incremental x coordinates. Specifically, all x coordinates satisfy $0 = x_1 < x_2 < x_3 < \cdots < x_n$. All y coordinates are positive except the first and the last points whose y coordinates are zeroes.

The range of the mountain is the polygon whose boundary passes through points (x_1, y_1) to (x_n, y_n) in turn and goes back to the first point. In this problem, your task is to calculate the area of the range of a mountain in the picture.

Input

The input has several test cases and the first line describes an integer t ($1 \le t \le 20$) which is the total number of cases.

In each case, the first line provides the integer n ($1 \le n \le 100$) which is the number of points used to describe the range of a mountain. Following n lines describe all points and the i-th line contains two integers x_i and y_i ($0 \le x_i, y_i \le 1000$) indicating the coordinate of the i-th point.

Output

For each test case, output the area in a line with the precision of 6 digits.

Example

standard input	standard output
3 3 0 0 1 1 2 0 4 0 0 5 10 10 15 15 0 5 0 0 3 7 7 2 9 10 13 0	1.000000 125.000000 60.500000