8474   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.

Sample Input

```
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
```

Sample Output

```
1.000000
```

```
125.000000
60.500000
```