

**2004/2005 SOUTHERN CALIFORNIA REGIONAL  
ACM INTERNATIONAL COLLEGIATE PROGRAMMING CONTEST**

**Problem 6  
Starving Students General Contractor**

Every summer, the manager of Starving Students General Contractor hires local college students to assist with various tasks around construction sites. Ordinarily, he hires engineering students to assist with the measurements for laying carpet and other floor coverings. Each year, without any special instruction, the engineers would head out to the new houses and return with annotated floor plans with each measurement marked according to Figure 6.1. The manager then submitted these drawings to the carpet supplier who calculated the area from the drawings.

This year, however, he had so much business that he started hiring math students to measure for floor covering. As with the engineers, he sent the mathematicians out to the houses with no special training. Rather than returning with detailed floor plans, the math students submitted lists of connected vectors. The vectors recorded the length of a wall and the angle that the adjacent wall made with respect to the current wall.

After his initial appraisal of the work as unusable, he realized his good fortune: if he could obtain a computer program to interpret this information, he could calculate the area to verify that the carpet supplier was not inflating the areas for illicit profit. To solve the problem, the manager reassigned several computer science students (your team), who were quite bored writing Excel macros for the finance department. Fortunately, the math students always measured in closed loops, working their way clockwise through the insides of the houses.

Input to your program is a list of wall measurements, one segment per input line. Each measurement begins with a wall length, in inches, followed by whitespace, then an angle in degrees that represents the “turn” that the math students made to measure the adjacent wall. A left turn is measured positive and a right turn is measured negative. The final segment that closes the loop is marked with 0 degrees. The sample input represents the measurements in Figure 6.1. No houses have more than 100 walls. Angle measurements are in the range [-179.0,179.0] degrees.

Output is a single number representing the square feet of area enclosed by the wall measurements. Round the area to the nearest square foot.

*Sample Input*

```
72 90
144 -90
216 -90
258 -90
108 90
6 90
108 -90
126 -90
210 -90
84 -90
30 90
42 -90
36 90
6 90
36 45
50.911688 45
96 -90
72 -90
246 0
```

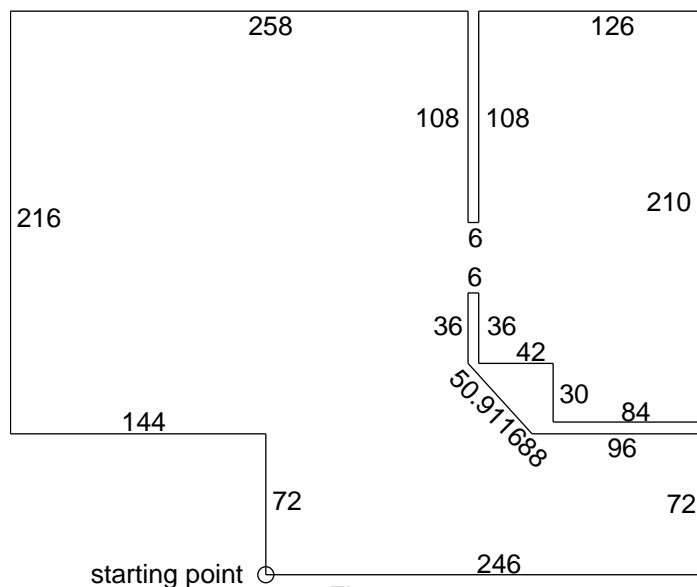


Figure 6.1

*Output for the Sample Input*

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