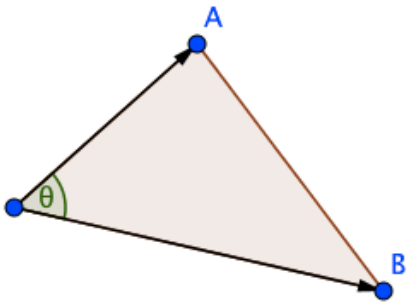
Problem G. General interpretation of two vectors

Let's consider a 3D world. We can consider two nonzero vectors $\vec{a} = (a_1, a_2, a_3)$ and $\vec{b} = (b_1, b_2, b_3)$. Write a program that calculates:

- θ $(0 \leq \theta \leq 180°)$: the angle between $\vec{a}$ and $\vec{b}$, in degrees
- S: the area of the triangle determined by $\vec{a}$ and $\vec{b}$. If $\vec{a}$ is parallel to $\vec{b}$, the area is 0.



Input

Your input consists of an arbitrary number of records, but no more than 1,000.

Each record is a line that consists of six integers $a_1, a_2, a_3, b_1, b_2, b_3$ $(-10^4 \leq a_1, a_2, a_3, b_1, b_2, b_3 \leq 10^4)$.

The end of input is indicated by a line containing only the value -1.

Output

For each input record, print two numbers θ and S. You may print out the numbers in any acceptable format. Your answer will be considered correct if and only if $|(your\ answer) - (our\ answer)| \leq 10^{-4}$.

Example

Standard input	Standard output
1 2 3 4 5 6 -1 -3 -5 2 4 6 1 0 0 0 1 0 1 0 0 2 0 0 -1	12.933154 3.6742346 173.646829 2.44948 90.000 0.500000 0 0

Time Limit

1 second.