Problem I
Crystal Ball

Time Limit: 1 seconds
Memory Limit: 512 Megabytes

Problem description

Tuan is a famous prophet because of his predictability, as he also has a special super-power. He owns a crystal ball with radius $r = 1$. When the ball is positioned so that its center is as the origin $O(0, 0, 0)$ in 3-dimensional space, it can float in the air and rotate around its center in any direction. When predicting a certain event, Tuan focuses on 3 points $A(x_A, y_A, z_A)$, $B(x_B, y_B, z_B)$ and $C(x_C, y_C, z_C)$ on the surface of the sphere. With his special super-power, the ball will automatically rotate around $\overrightarrow{OP}$ with an angle equal to the angle between 2 vectors $\overrightarrow{OB}$ and $\overrightarrow{OC}$, where $\overrightarrow{OP}$ is a unit normal vector of OBC plane. At that time, the coordinates of points A, B, and C will be changed. Depending on the changes, Tuan will predict future events.

Your task is to find out the new coordinate of point A after changed.

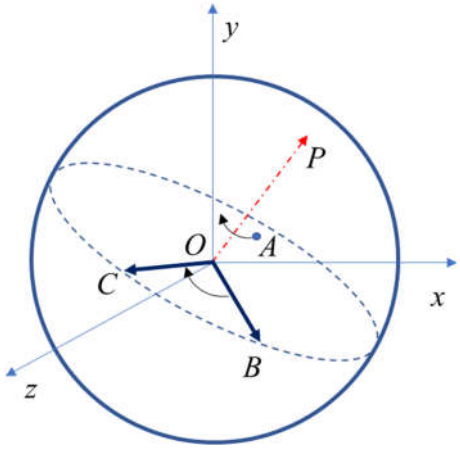

Figure 4. A Sphere

Input

The first line includes T $(1 \leq T \leq 100)$, the number of test cases.

The first line of each test case consists of 6 real numbers $x_A, y_A, x_B, y_B, x_C, y_C$, where $x_A^2 + y_A^2 \leq 1$, $x_B^2 + y_B^2 \leq 1$ and $x_C^2 + y_C^2 \leq 1$.

The second line contains 3 integers s_A, s_B and s_C ($0 \leq s_A, s_B, s_C \leq 1$). s_A = 1 means that $z_A \geq 0$ and otherwise $z_A < 0$; and similarity for points B and C.

Output

Including T lines corresponding to each test case.

Each line contains 3 decimals as the new coordinate of point A.

Your answer will be accepted if its relative or absolute error does not exceed 10^{-6}.

Example:

Input	Output
3 0.0 0.5 0.0 0.0 1.0 0.0 1 1 1 0.5 0.5 0.5 0.5 0.0 0.0 0 0 1 0.5 0.5 0.5 -0.5 -0.5 0.5 1 1 1	0.86602540 0.5 0.0 0.0 0.0 1.0 0.0 1.0 0.0