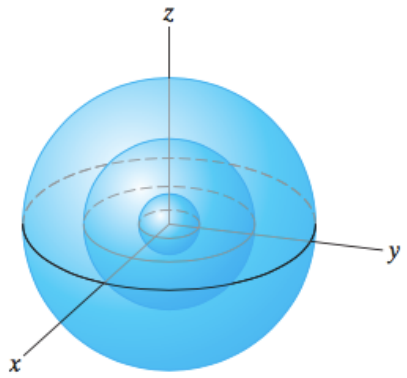
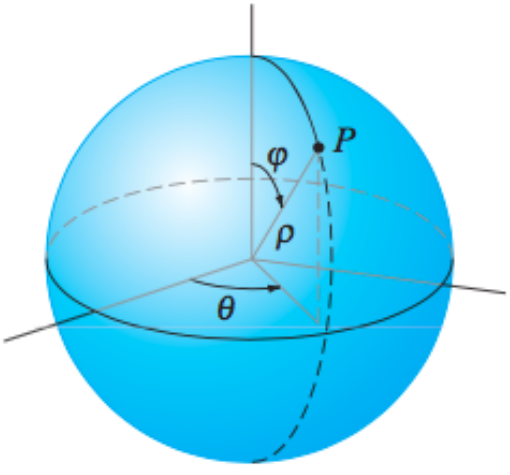
Problem C. Converting Coordinates

Try to fill all of space in 3D with spheres centered at the origin. Then every point $P \in \mathbb{R}^3$, except the origin, lies on a single such sphere.



The ***spherical coordinates*** of P are given by specifying the radius ρ of the sphere containing P and the "latitude and longitude" readings of P along this sphere. More precisely, the spherical coordinates (ρ, φ, θ) of P are defined as follows:

- ρ is the distance from P to the origin.
- φ is the angle between the positive z-axis and the ray through the origin and P
- θ is the angle between the positive x-axis and the ray made by dropping a perpendicular from P to the xy-plane.



It is standard practice to impose the following restrictions on the range of values for the individual coordinates: $\boldsymbol{\rho \geq 0,\ 0 \leq \varphi \leq 180°,\ 0 \leq \theta < 360°}$.

With such restrictions, all points of $\mathbb{R}^3$, except those on the z-axis, have a uniquely determined set of spherical coordinates. In other words, all points which is not on the z-axis has a unique spherical coordinate.

You are given (x, y, z), the Cartesian coordinates of the point P. It is guaranteed that P doesn't lie on the z-axis. Write a program that converts this Cartesian coordinates (x, y, z) into spherical coordinates (ρ, φ, θ).

Input

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

Each record consists of a line containing three integers x, y and z ($-100 \leq x, y, z \leq 100$, $x^2 + y^2 > 0$).

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

Output

For each input record, print ρ ($\rho \geq 0$), φ ($0 \leq \varphi \leq 180°$) and θ ($0 \leq \theta < 360°$), each separated by a space. You should print φ and θ in **degrees** (not in radians). You may print the numbers in the way you want, but note that your answer will be considered correct if its absolute or relative error does not exceed 10^{-4}.

Namely: let's assume that your answer is a, and the answer of the jury is b. The checking script will consider your answer correct, if $\frac{|a-b|}{\max(1,b)} \leq 10^{-4}$.

Example

Standard input	Standard output
3 4 5 3 4 -5 -3 0 4 -1	7.071067 45.0 53.13010 7.07106 135.0 53.1301 5.00 36.869897 180.0000000

Time Limit

1 second.