

Distance from a point to a line segment 3D

You are standing on a point $P(x_0, y_0, z_0)$ in a 3D world. (You are so small that you can consider yourself as a point) Rain is pouring, so you want to go home right now. Your home is a bit strange, it looks like a line segment that has two endpoints $A(x_1, y_1, z_1)$ and $B(x_2, y_2, z_2)$. (in other words, \overline{AB})

You want to go to your home as soon as possible. You are home if and only if you are standing on the line segment \overline{AB} . It takes 1 seconds for you to move distance 1.

Given the coordinates of three points P , A and B , please find the minimum time you need in order to go to your home.

Input

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

Each line contains six integers $x_0, y_0, z_0, x_1, y_1, z_1, x_2, y_2, z_2$ ($0 \leq x_i, y_i, z_i \leq 10^3$), each separated by a space. It is guaranteed that three points P , A and B are all distinct. The end of input is indicated by a line containing only the value -1 .

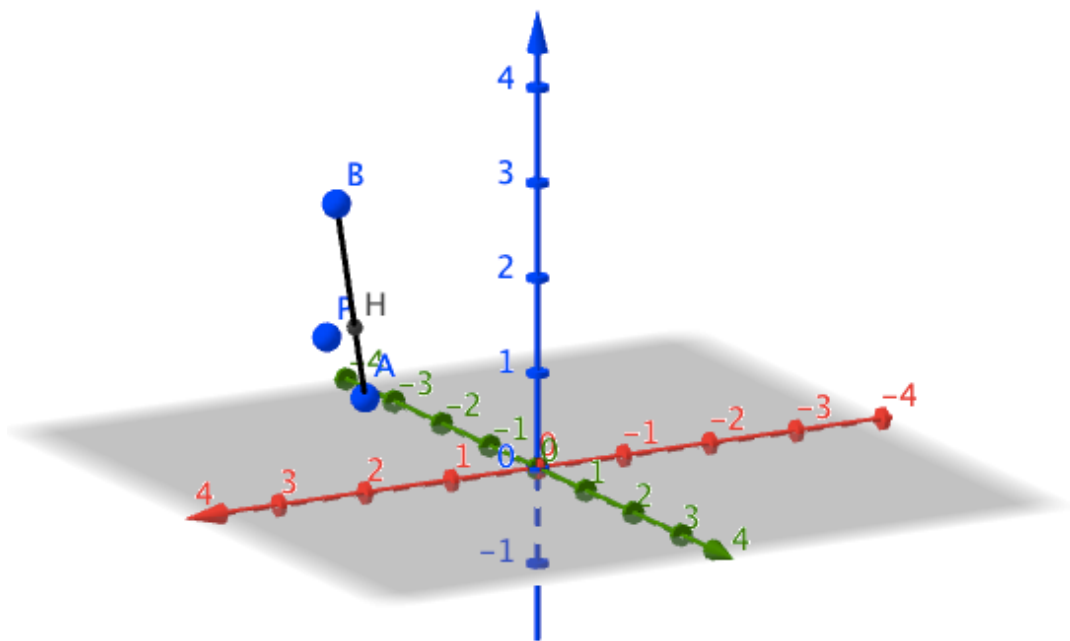
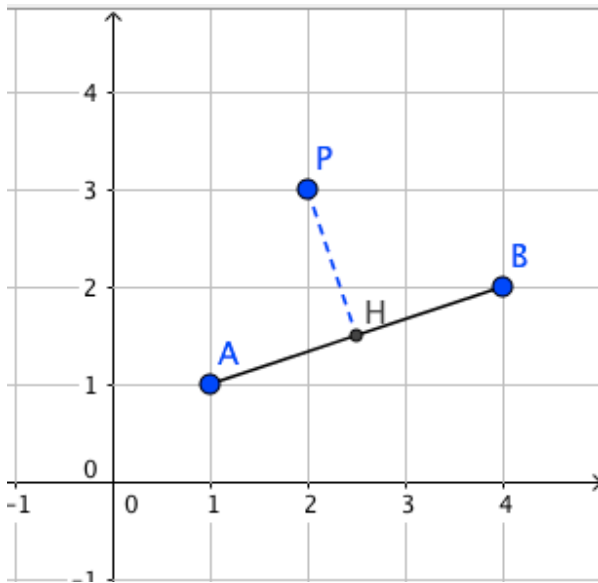
Output

For each line, print the minimum time you need in order to go to your home, in seconds. Print 4 digits (even if it is zero) after the decimal point. Your answer will be considered correct if $|(your\ answer) - (our\ answer)| \leq 10^{-4}$.

Example

Standard input	Standard output
2 3 0 1 1 0 4 2 0	1.5811
5 1 0 1 1 0 4 2 0	1.4142
3 1 2 2 0 1 4 3 4	0.3015
-1	

Explanation of the example



Time Limit

1 second.