

## M. 3D Geometry

An axis-aligned tetrahedron (also known as triangular pyramid)  $DABC$  is a convex polyhedron in three dimension with vertices

- $D : (x_1, y_1, z_1)$ ,
- $A : (x_2, y_1, z_1)$ ,
- $B : (x_1, y_2, z_1)$ ,
- $C : (x_1, y_1, z_2)$ .

Also, an axis-aligned cube  $PQRSDEFG$  is a convex polyhedron with vertices

- $P : (x_3, y_3, z_3)$ ,
- $Q : (x_3, y_3, z_4)$ ,
- $R : (x_3, y_4, z_3)$ ,
- $S : (x_3, y_4, z_4)$ ,
- $D : (x_4, y_3, z_3)$ ,
- $E : (x_4, y_3, z_4)$ ,
- $F : (x_4, y_4, z_3)$ ,
- $G : (x_4, y_4, z_4)$ .

Given an axis-aligned tetrahedron  $DABC$  and an axis-aligned cube  $PQRSDEFG$ , find the volume of their intersection.

### Input

The input consists of several test cases terminated by end-of-file. For each test case,

There are 4 lines, and the  $i$ -th line contains three integers  $x_i$ ,  $y_i$ , and  $z_i$ .

- $-500 \leq x_i, y_i, z_i \leq 500$  for each  $1 \leq i \leq 4$
- $x_1 \neq x_2, y_1 \neq y_2, z_1 \neq z_2$
- $x_3 \neq x_4, y_3 \neq y_4, z_3 \neq z_4$
- In each input, the number of test cases does not exceed  $10^5$ .

### Output

For each test case, output a float which denotes the volume.

Your answer is considered correct if its *absolute* or *relative error* doesn't exceed  $10^{-6}$ .

### Sample Input

```
0 0 0
1 1 1
0 0 0
1 1 1
0 0 0
2 2 2
0 0 0
1 1 1
0 2 0
2 0 2
1 0 1
0 1 0
```

### Sample Output

```
0.166666667
0.8333333333
0.166666667
```