Linear algebra is useful in many applications. A common calculation is to use the dot product and norm of two vectors for getting the their angles:

$$\cos\theta = \frac{\vec{a}\cdot\vec{b}}{\|\vec{a}\|\|\vec{b}\|},$$

Where $\vec{a}$ and $\vec{b}$ are two vectors and $\|\cdot\|$ is the norm that

$$\|\vec{a}\| = \sqrt{\vec{a}\cdot\vec{a}}$$

And $\cdot$ is known as inner product or dot product:

$$\vec{a}\cdot\vec{b} = \sum_{i=1}^{n} a_i b_i\,,$$

Where n is the length of the two vectors.
Write a program to calculate the $\cos\theta$ between three-dimensional vectors.

Input

The input contains several cases and ends with EOF. Each case contains three points $\vec{o}$, $\vec{p}$, and $\vec{q}$ in the three-dimensional space.

Output

For each case, output the $\cos\theta$ between $\vec{p}-\vec{o}$ and $\vec{q}-\vec{o}$ to the hundredths place of the decimal point. Note: Please implement the division to prevent from precision issue.

Sample Input

-459 -51 -172 -26 -350 209 -33 -171 436
-60 200 -383 -242 311 452 -9 493 431
323 -69 -141 90 399 -347 -208 -130 -96
198 199 376 -58 205 257 27 368 393
142 -227 -482 385 175 288 -209 -197 156

Sample Output

The cosine theta between vectors (433, -299, 381) and (426, -120, 608) is 0.92
The cosine theta between vectors (-182, 111, 835) and (51, 293, 814) is 0.94
The cosine theta between vectors (-233, 468, -206) and (-531, -61, 45) is 0.28
The cosine theta between vectors (-256, 6, -119) and (-171, 169, 17) is 0.62
The cosine theta between vectors (243, 402, 770) and (-351, 30, 638) is 0.63