Class 2 - Find the Torsional Angle ★

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You are given four points A, B, C and D in a 3-dimensional Cartesian coordinate system. You are required to print the angle between the plane made by the points A, B, C and B, C, D in degrees(**not radians**). Let the angle be PHI.

$Cos(PHI) = (X.Y)/|X||Y|$ where $X = AB \times BC$ and $Y = BC \times CD$.

Here, $X.Y$ means the dot product of X and Y, and $AB \times BC$ means the cross product of vectors AB and BC. Also, $AB = B - A$.

Input Format

One line of input containing the space separated floating number values of the X, Y and Z coordinates of a point.

Output Format

Output the angle correct up to two decimal places.

Sample Input

```
0 4 5
1 7 6
0 5 9
1 7 2
```

Sample Output

```
8.19
```

Change Theme   Python 3   ⌄   ⟳ ⤢ ⚙

```
   7            self.z = z
   8
   9       def __sub__(self, no):
  10           return Points(self.x - no.x, self.y - no.y, self.z - no.z)
  11
  12       def dot(self, no):
  13           return self.x * no.x + self.y * no.y + self.z * no.z
  14
  15       def cross(self, no):
  16           x = self.y * no.z - self.z * no.y
  17           y = self.z * no.x - self.x * no.z
  18           z = self.x * no.y - self.y * no.x
  19
  20           return Points(x, y, z)
  21
  22       def absolute(self):
  23
  23           return pow((self.x ** 2 + self.y ** 2 + self.z ** 2), 0.5)
```

```
25  if __name__ == '__main__':
26      points = list()
27      for i in range(4):
28          a = list(map(float, input().split()))
29          points.append(a)
30
31      a, b, c, d = Points(*points[0]), Points(*points[1]), Points(*points[2]), Points
```

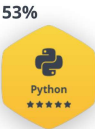Line: 10 Col: 49

⬆ Upload Code as File   ☐ Test against custom input   **Run Code**   **Submit Code**

You have earned 20.00 points!

61/115 challenges solved.

53%

Python
★★★★★

Congratulations

You solved this challenge. Would you like to challenge your friends?

Next Challenge

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⊘ **Test case 0**	
⊘ **Test case 1**	
⊘ **Test case 2** 🔒	
⊘ **Test case 3** 🔒	
⊘ **Test case 4** 🔒	
⊘ **Test case 5** 🔒	
⊘ **Test case 6** 🔒	

Compiler Message

Success

Input (stdin)   Download

```
1   0 4 5
2   1 7 6
3   0 5 9
4   1 7 2
```

Expected Output   Download

```
1   8.19
```

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