Problem A
Loop of Chocolate
Time Limit: 2 seconds

Let's make sweets of a fancy shape that is a loop of chocolate.

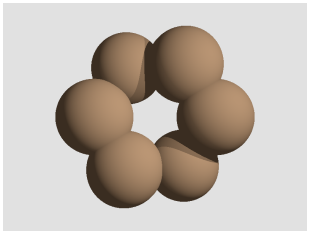
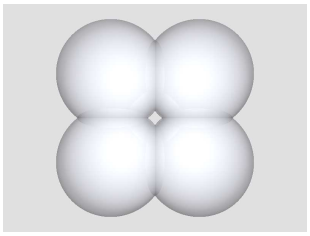
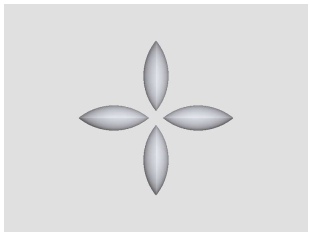


Figure A.1. A loop of chocolate formed by a union of six spheres

The shape of a loop is formed by a union of a number of spheres of the same size, where every sphere intersects with exactly two others.



(a) Union of four spheres



(b) Four intersections of the four spheres in (a)

Figure A.2. A loop of chocolate formed by a union of four spheres

Your job is to write a program that, for given the size and the positions of spheres, computes the total volume of the union of the spheres, i.e., the amount of chocolate required for filling the loop formed by the union.

[Hints] Two spheres of the same radius r intersect each other when the distance between their centers, d, is less than $2r$. The volume of the intersection is known to be

$$\frac{2}{3}\pi(r - d/2)^2(2r + d/2).$$

The volume of the sphere of radius r is $4\pi r^3/3$.

Input

The input consists of a single test case of the following format.

$n\ r$
$x_1\ y_1\ z_1$
$\vdots$
$x_n\ y_n\ z_n$

n and r are integers. n is the number of spheres ($4 \leq n \leq 100$). All the spheres has the same radius r ($2 \leq r \leq 100$). (x_k, y_k, z_k) indicates the coordinates of the center of the k-th sphere ($k = 1, \ldots, n$). All of x_k, y_k, and z_k are integers between -100 and 100, inclusive.

The k-th and the $k + 1$-th spheres intersect each other for $1 \leq k < n$. The 1-th and the n-th spheres also intersect. No other pairs of spheres intersect.

Output

Output in a line the volume of the union of the spheres. Relative error of the output should be within 10^{-7}.

Sample Input 1

```
6 9
20 0 10
20 10 0
10 20 0
0 20 10
0 10 20
10 0 20
```

Sample Output 1

```
17149.528141
```

Sample Input 2

```
4 12
10 10 0
10 -10 0
-10 -10 0
-10 10 0
```

Sample Output 2

```
27813.56696
```

Sample Input 3

```
6 9
23 3 13
20 10 0
10 20 0
3 23 13
0 10 20
10 0 20
```

Sample Output 3

```
17470.837758
```

Sample Input 4

```
4 2
0 0 0
3 0 0
3 3 0
0 3 0
```

Sample Output 4

```
122.52211349
```

Sample Input 5

```
8 70
100 100 0
0 100 0
-100 100 0
-100 0 0
-100 -100 0
0 -100 0
100 -100 0
100 0 0
```

Sample Output 5

```
10220648.1
```