

### Problem 3—Unfair Slicing

Dr. Zoidberg enjoys sharing a pizza with his friends, and, since he is naturally equipped to slice the pizza without the use of any external tool, he insists on doing that as well. Unfortunately for the employees of Planet Express, Dr. Zoidberg doesn't do a terribly good job of this. All the pieces are (more or less) wedge-shaped, sliced from a fixed point on the pizza to the edge of the pizza. The cuts to the pizza emanate from the fixed point evenly, so that the angles between successive cuts are all equal to each other. The problem is that the fixed point from which these cuts emanate is not necessarily the center of the pizza.

We imagine the pizza to be centered at the origin (i.e. the *true* center) with one of the cuts proceeding straight up from the fixed point (i.e. sliced in a direction parallel to the positive y-axis). Given the radius of the pizza, the number of slices, and the fixed point from which the cuts emanate, you are to print out the area of each of the slices, in clockwise order, starting clockwise from the vertical upward cut.

**INPUT SPECIFICATION.** Each input case will consist of three floating-point numbers and one integer with one space separating each number from its adjacent numbers. The first two numbers are the x- and y-coordinates of the fixed point on the pizza from which the cuts emanate. This point is guaranteed to be on the interior of the pizza (not on the edge or outside of the pizza). The third number is the radius of the pizza. The fourth is the number of cuts made to the pizza. An **<EOLN>** follows each input case. The last case is followed by “0 0 0 0**<EOLN>**”, which is not to be processed.

**OUTPUT SPECIFICATION.** The output cases appear in the same order as their corresponding input cases. Each output case is of the form “Case *c*: The areas are:” followed by **<EOLN>**, where *c* is the case number, followed by the areas in clockwise order of each slice. Each area should be rounded to the nearest tenth and printed with one digit to the right of the decimal point, and it should be followed by **<EOLN>**. An extra **<EOLN>** follows each output case.

#### **SAMPLE INPUT.**

```
0.0 0.10 0.5<EOLN>
0.9 0.10 0.5<EOLN>
0.0 0.0 0.0<EOLN>
<EOF>
```

#### **SAMPLE OUTPUT.**

```
Case 1: The areas are:<EOLN>
62.8<EOLN>
62.8<EOLN>
62.8<EOLN>
62.8<EOLN>
62.8<EOLN>
<EOLN>
Case 2: The areas are:<EOLN>
1.2<EOLN>
54.9<EOLN>
202.0<EOLN>
54.9<EOLN>
1.2<EOLN>
<EOLN>
<EOF>
```