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/* Problem 2--Homer's Pizza
   This was very straightforward with a little bit linear algebra and
   trig. */

import java.io.*;
import java.util.*;

public class prob2 {

 private static Scanner in;
 private static PrintWriter out;
 private static int cs;
 private static double x1,y1,x2,y2,r;

 public static void main (String[] args) throws Exception {

  in = new Scanner (new File ("prob2.in"));
  out = new PrintWriter ("prob2.out");
  cs = 1;
  while (ReadIn()) Process ();
  in.close ();
  out.close ();
 }

 /* ReadIn reads in the data */
 public static boolean ReadIn () throws Exception {

  r = in.nextDouble(); //The radius
  if (r==0) return false;
  x1 = in.nextDouble();//The first point of the cut
  y1 = in.nextDouble();
  x2 = in.nextDouble();//The second point
  y2 = in.nextDouble();
  return true;
 }

 /* Process computes and prints the area percentage */
 public static void Process() throws Exception {

  double vx = x1-x2; //Compute vector
  double vy = y1-y2;
  double vl = Math.sqrt(vx*vx+vy*vy);
  vx /= vl; //Normalize Vector
  vy /= vl;
  double dp = -x1*vx-y1*vy;
  double px = dp*vx+x1; //Project center onto line
  double py = dp*vy+y1;
  double l = Math.sqrt(px*px+py*py); //Distance from center to line
  if (l >= r) { //Pizza lies on one side of the line
   out.printf ("Case %d: Homer has eaten 100%% of the pizza!\r\n\r\n",
               cs++);
   return;
  }
  double angle = 2*Math.acos (l/r); //Central angle of pizza
  double triarea = 0.5*r*r*Math.sin(angle); //Area of triangle
  double slicearea = 0.5*r*r*angle; //Area of slice
  double caparea = slicearea - triarea; //Area of arc (small piece)
  double circlearea = Math.PI*r*r; //Total area
  double bigarea = circlearea - caparea; //Area of big piece
  int percentage = (int)(100*bigarea/circlearea+0.5);
  out.printf ("Case %d: Homer has eaten %d%% of the pizza!\r\n\r\n",
              cs++,percentage);
 }
}

```