

Polygon.java

```
1 import java.awt.Color;
4
5 public class Polygon extends Shape {
6     public Polygon()
7     {
8         this(3, 1);
9     }
10
11     public Polygon(int N, double radius)
12     {
13         this(0,0,Color.black,N,radius);
14     }
15
16     public Polygon(int x, int y, Color color, int N, double radius)
17     {
18         super(x,y,color);
19         numSides = N;
20         this.radius = radius;
21     }
22
23     public double getPerimeter()
24     {
25         return numSides*getSide();
26     }
27
28     public double getArea()
29     {
30         double apothem = getSide()/(2*Math.tan(180/numSides));
31         return getPerimeter()*apothem/2;
32     }
33
34     public double getAngle()
35     {
36         return 360/numSides;
37     }
38
39     public double getSide()
40     {
41         return 2*radius*Math.sin(180/numSides);
42     }
43
44     public String toString()
45     {
46         return "(" + getSide() + ", " + getAngle() + ", " + getPerimeter() + ", " + getArea() +
47         ")";
48     }
49
50     public boolean doOverlap(Shape s2)
51     {
52         return (this.getX() == s2.getX() && this.getY() == s2.getY());
53     }
54
55     public BoundingBox getBoundingBox()
56     {
57         double minX = this.getX() - radius;
58         double minY = this.getY() - radius;
59         double width = 2*radius;
```

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```
59     double height = 2*radius;
60
61     return new BoundingBox(minX, minY, width, height);
62 }
63
64 public void draw(Graphics g)
65 {
66     g.setColor(this.getColor());
67     int[] x = new int[numSides];
68     int[] y = new int[numSides];
69
70     for(int i = 0; i < numSides; i++)
71     {
72         double angle = i*getAngle();
73         //g.drawLine((int)(this.getX()+radius*Math.cos(Math.toRadians(angle))),
74                     //(int)(this.getY()+radius*Math.sin(Math.toRadians(angle))),
75                     //(int)(this.getX()+radius*Math.cos(Math.toRadians(angle+getAngle()))),
76                     //(int)(this.getY()+radius*Math.sin(Math.toRadians(angle+getAngle()))));
77
78         x[i] = (int)(this.getX()+radius*Math.cos(Math.toRadians(angle)));
79         y[i] = (int)(this.getY()+radius*Math.sin(Math.toRadians(angle)));
80     }
81
82     g.fillPolygon(x,y,numSides);
83 }
84
85 private int numSides;
86 private double radius;
87 }
88
```