```java
// Lab 6: Polygon
// I had to turn this one in late. :(
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// CSCI 1913

class Polygon
{
  private int[] sideLengths;

  public Polygon(int sides, int lengths)
  {
    int index = 0;
    sideLengths = new int[sides];
    for (int length: lengths)
    {
      sideLengths[index] = length;
      index += 1;
    }
  }

  public int side(int number)
  {
    return sideLengths[number];
  }

  public int perimeter()
  {
    int total = 0;
    for (int index = 0; index < sideLengths.length; index += 1)
    {
      total += side(index);
    }
    return total;
  }
}

// Begin lab
class Rectangle extends Polygon
{
  int width = 0;
  int length = 0;

  public Rectangle(int width, int length)
  {
    super(4, width, length, width, length);
    this.width = width;
    this.length = length;
```

```
48    }
49
50    public int area()
51    {
52      return width*length;
53    }
54
55  // perimeter is inherited
56  }
57
58
59  class Square extends Rectangle
60  {
61
62    private int length;
63
64    public Square(int length)
65    {
66      super(length, length);
67      this.length = length;
68    }
69
70    public int area()
71    {
72      return length*length;
73    }
74
75  // perimeter is inherited here also
76  }
77
78  //  SHAPES. Public tests for the classes RECTANGLE and SQUARE.
    Comments show
79  //  what each test must print, and how many points it is worth.
80
81  class Shapes
82  {
83    public static void main(String[] args)
84    {
85      Rectangle wreck = new Rectangle(3, 5);
86
87      System.out.println(wreck.side(0));      //  3   1 point.
88      System.out.println(wreck.side(1));      //  5   1 point.
89      System.out.println(wreck.side(2));      //  3   1 point.
90      System.out.println(wreck.side(3));      //  5   1 point.
91      System.out.println(wreck.area());       //  15  1 point.
92      System.out.println(wreck.perimeter());  //  16  1 point.
```

```
93
94      Square nerd = new Square(7);
95
96      System.out.println(nerd.side(0));       //  7   1 point.
97      System.out.println(nerd.side(1));       //  7   1 point.
98      System.out.println(nerd.side(2));       //  7   1 point.
99      System.out.println(nerd.side(3));       //  7   1 point.
100     System.out.println(nerd.area());        //  49  1 point.
101     System.out.println(nerd.perimeter());   //  28  1 point.
102   }
103 }
104
```