```java
1  /*
2   * Project #1 - Writing Test Cases
3   * CMPE 187 - Team #16
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8   */
9
10 /*
11  * A class that creates a triangle and checks if it is a
12  * right, isosceles, scalene, or not a triangle.
13  */
14
15 public class Triangle
16
17 {
18
19     /*
20      * Instance variables for side lengths
21      */
22     private int x; // side 1
23     private int y; // side 2
24     private int z; // side 3
25
26     /*
27      * Constructor
28      */
29     public Triangle (int x, int y, int z)
30     {
31         this.x = x;
32         this.y = y;
33         this.z = z;
34     }
35
36
37     /*
38      * Test Case to check if it is NOT a triangle
39      * That is if one of sides lengths are of a negative value
40      */
41     public boolean isATriangle()
```

```
42      {
43          if (x <= 0 || y <= 0 || z<= 0) {
44              return false;
45          }
46          //Check for arithmetic exception
47          try {
48              Math.addExact(x, y);
49              Math.addExact(x, z);
50              Math.addExact(y, z);
51          } catch (ArithmeticException e) {
52              System.out.        ("Out of range");
53              System.exit(0);
54          }
55          //Definition of a valid triangle: sum of any two sides is
   greater than the other side
56          if (x + y > z && x + z > y && y + z > x) {
57              return true;
58          } else {
59              return false;
60          }
61      }
62


63


64


65      /*
66       * Test Case to check if it is a EQUILATERAL triangle
67       * True if the sides are all equal to one another
68       */
69      public boolean isEquilateralTriangle()
70      {
71          if ((x == y) && (x == z) && (y ==z) && ((x > 0) && (y > 0) &&
   (z > 0)))
72          {
73              return true;
74          }
75          else
76          {
77              return false;
78
79          }
80      }
```

```java
81
82
83     /*
84      * Test Case to check if it is a ISOSCELES triangle
85      * True if 2 sides are the same length
86      */
87     public boolean isIsoscelesTriangle()
88     {
89         if (((x == y) && (x!=z))  // 1st side equals 2nd side, but 1st
   side doesn't equal 3rd side
90                 || (x==z) && (x!=y) // 1st side equals 3rd side, but
   1st side doesn't equal 2nd side
91                 || (y==z) && (y!=x) && ((x > 0) && (y > 0) && (z
   >0))) // 2nd side equals 3rd side, but 2nd side doesn't equal 1st side
92         {
93             return true;
94         }
95         else
96         {
97             return false;
98         }
99
100    }
101    /*
102     * Test Case to check if it is a SCALENE triangle
103     */
104    public boolean isScaleneTriangle()
105    {
106        if ((x != y) && (x != z) && (y != z) && ((x > 0) && (y > 0) &&
   (z >0)))
107        // 1st side doesn't equal 2nd side
108        // 1st side doesn't equal 3rd side
109        // 2nd side doesn't equal 3rd side
110        {
111            return true;
112        }
113        else
114            return false;
115    }
116
117 }
```

118