(Partial) Operator Precedence Table

<table>
<thead>
<tr>
<th>Operators</th>
<th>Associativity</th>
</tr>
</thead>
<tbody>
<tr>
<td>! ++ -- (pre &amp; post inc/dec)</td>
<td>right to left</td>
</tr>
<tr>
<td>* / %</td>
<td>left to right</td>
</tr>
<tr>
<td>+ -</td>
<td>left to right</td>
</tr>
<tr>
<td>&lt; &lt;= &gt; &gt;=</td>
<td>left to right</td>
</tr>
<tr>
<td>== !=</td>
<td>left to right</td>
</tr>
<tr>
<td>&amp;&amp;</td>
<td>left to right</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>=</td>
<td>right to left</td>
</tr>
</tbody>
</table>

1) What are the values of x, y, z (left) and a, b, c (right) after the following code segments are executed?

```java
int x = 6, y = 3, z = 0;
if ( --x > 5 && y++ > 3 )
    z = ++x + y--;
else
    z = x++ + --y;
```

```java
int a = 8, b = 5, c = 0;
if ( ++a <= 8 || b-- >= 4 )
    c = a++ + --b;
else
    c = ++a + b--;
```

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
<th>z</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
<th>c</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

2) What is the equivalent Java expression for the following expression such that no ! operators are used? 
( != is a different operator than ! )

```
!( x != 17 || y > 3 )
```

3) You are asked to test the TwoSmallest program that was part of PA2. The only input values you are allowed to use are 0, 1, 2, 3, and 4. Two values have already been entered: 1 and 3. Based on this information, what effect will each of the following additional inputs have on the current state of the variables smallest and secondSmallest? For each input value, assume the user has already entered 1 and 3, and now enters just this one additional input. Answer for 0. Then start over with just 1 and 3 entered, and answer for 1. Then start over with just 1 and 3 entered, and answer for 2. And so on …

After 1 and 3 are entered, what effect would be tested with each input:

<table>
<thead>
<tr>
<th>Next input</th>
<th>Effect tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>A) smallest assigned to secondSmallest; input becomes new smallest</td>
</tr>
<tr>
<td>1</td>
<td>B) input assigned to secondSmallest; smallest unchanged</td>
</tr>
<tr>
<td>2</td>
<td>C) no change to either smallest or secondSmallest</td>
</tr>
<tr>
<td>3</td>
<td>D) secondSmallest assigned to smallest; input becomes new secondSmallest</td>
</tr>
<tr>
<td>4</td>
<td>E) input assigned to smallest; secondSmallest unchanged</td>
</tr>
</tbody>
</table>
4) Assume a program had the following definitions (Point has an x and y value with proper equals() defined):

```java
Point p1 = new Point(37, 23);
Point p2 = p1;
Point p3 = new Point(37, 23);
```

What results would be produced by evaluating the following expressions (left to right; top to bottom)?

- `p1 == p2` ____________
- `p1.equals(p2)` ____________
- `p1 == p3` ____________
- `p1.equals(p3)` ____________
- `p2 == p3` ____________
- `p2.equals(p3)` ____________
- `p1.translate(1, 1);` // Add 1 to the x and y coordinates in the Point object ref'ed by p1
- `p1.equals(p2)` ____________
- `p1.equals(p3)` ____________
- `p2.equals(p3)` ____________
- `p2.translate(1, 1);` // Add 1 to the x and y coordinates in the Point object ref'ed by p2
- `p1.equals(p2)` ____________
- `p1.equals(p3)` ____________
- `p2.equals(p3)` ____________
- `p3.translate(1, 1);` // Add 1 to the x and y coordinates in the Point object ref'ed by p3
- `p1.equals(p2)` ____________
- `p1.equals(p3)` ____________
- `p2.equals(p3)` ____________

5) What output is produced with the following code fragment? Assume `method1()` is invoked as

```java
public class Quiz2 {
    private int a;       // Line 3
    public void method1( int x )
    {                  // Line 7
        int a;       // Line 7
        int b = x;
        a = b / 5;
        this.a = b % 5;
        System.out.println( "a = " + a );
        System.out.println( "b = " + b );
        System.out.println( "this.a = " + this.a );
        System.out.println( "x = " + x );
        System.out.println( "method2() result = " + method2( x ) );
        System.out.println( "a = " + a );
        System.out.println( "b = " + b );
        System.out.println( "this.a = " + this.a );
        System.out.println( "x = " + x );
    }
    private int method2( int x )
    {
        int a = x;
        int b = this.a;
        x = 99;
        System.out.println( "a = " + a );
        System.out.println( "b = " + b );
        System.out.println( "this.a = " + this.a );
        System.out.println( "x = " + x );
        this.a = 37;
        b = b * 3;
        return a - 3;
    }
}
```

What is the initial value of `a` on Line 3? ______________

What is the initial value of `a` on Line 7? ______________

Output:

- `a = __________`
- `b = __________`
- `this.a = __________`
- `x = __________`
- `a = __________`
- `b = __________`
- `this.a = __________`
- `x = __________`
- `method2() result = __________`