CS101: Lab #3
Data and Expressions

1. Consider the numbered Java code below.

```
1)      int a = 5, b = 2;
2)      double c = 3.0;
3)      a += b;
4)      b++;
5)      c--;
6)      c *= a;
7)      System.out.println("a + b + c = " + (a + b + c));
```

   (a) Trace this sequence using a separate row for each statement.

   (b) Confirm your output with a Java program that executes these commands.

2. Consider the numbered Java code below.

```
1)      int a = 20;
2)      int b;
3)      double x = 3.5;
4)      String s = "All";
5)      x += a;
6)      x--;
7)      a /= 4 - 1;
8)      b = s.length();
9)      b += 4;
10)     System.out.println("a = " + a + ", b = " + b);
11)     System.out.println("x = " + x + "\ns = " + s);
```

   (a) Trace this sequence using a separate row for each statement.

   (b) Confirm your output with a Java program that executes these commands. Complete the code, including header comments (shown below). Have your instructor observe for grading.

```
/*
 * (Student Name)
 * (File Name)
 * (Assignment)
 * (Describe, in general, the code contained.)
 */
```

3. The following pseudocode describes a simple algorithm which swaps the values in two variables, `x` and `y`:

```
1)      print "Enter initial value of x: "
2)      input x
3)      print "Enter initial value of y: "
4)      input y
5)      set temp to x
6)      set x to y
7)      set y to temp
8)      print "x = " + x
9)      print "y = " + y
```

   (a) Trace this sequence using a separate row for each statement.

   (b) Implement this algorithm as a Java program to confirm your output.

4. Write a Java program that generates and prints quantities related to circles. (a) Read in a value for radius. (b) Calculate and print the corresponding values for diameter, circumference, and area.

   Use the built-in Java constant `Math.PI` for the value of π.

   Sample session:

```
Enter a radius value: 2.5
Diameter = 5.0
Circumference = 15.707963267948966
Area = 19.634954084936208
```

   Complete the code, including header comments. Have your instructor observe for grading.