PS 1: Part I

Problem 1: Java programming basics

1-1)

```java
import java.util.*;
public class Problem1 {
  public static void main(String[] args) {
     Scanner console = new Scanner(System.in);
     System.out.print("Enter an integer n: ");
     int n = console.nextInt();
     int sum = calculateSum(n);
     System.out.println("The sum of the numbers is: " + sum);
  }
  /*
   * This static method should take an integer n and return
   * the sum of all integers from 1 up to n, inclusive.
   */
   private static int calculateSum(int n) {
      int sum = 0;
      for (int i = 0; i <= n; i++) {
         sum+= i;
      }
      return sum;
   }
}
```

1-2)

a. 0.5
b. 3
c. 0
d. 0.33333…
e. cs112.0
f. true
g. 0.5
h. 6.0
i. 5.04
j. 4fivetrue

Problem 2: Conditional execution

2-1)

```
a)You won!
  scissors!
  lizard!
  You lost!
  You won!
  done

b)rock!
  scissors!
  lizard!
  done

c)lizard!
  spock
  done

d)scissors!
  lizard!
  done

e)paper!
  lizard!
  spock
  done


f)lizard!
  spock
  done
```

2-2)

The if condition “if (a == b || b == c || a == c)” which corresponds with the “You lost again!” statement will never be executed because none of the values equal each other at any given input.

Problem 3: Static methods

3-1

variables that belong to main()

x	y
8	-6
3	8
-6	-6

variables that belong to compute()

x	y
8	-6
-6	3
-6	4

output (the lines printed by the program)

```
8 -6
8 -6
8 3
3 8
-6 3
-6 -6
-6 4
```

3-2)

```java
public static String relationalOperator(int a, int b) {
    if (a > b)
       return ">";
    else if (a < b)
       return "<";
    else
       return "=";
  }
```

Problem 4: Loops

4-1)

```
   public static void oddProduct(int n) {
       int product = 1;
       for (int x = 1; x < n; x++) {
          if (x % 2 == 1)
              product *= x;
       }
       System.out.println(product);
    }
```

4-2)

```
public static void increaseBy(int n, int f, int t) {
       int r = n;
       while (r < (n+f*t)) {
          System.out.println(r);
          r += f;
       }
    }
```

4-3)

```
public static void diamond(int n) {
     for (int i = 0; i < n; i++) {
        if (i <= n / 2) {
           for (int j = 1; j <= i; j++) {
              System.out.print(j);
           }
        } else {
           for (int j = 1; j <= n - i; j++) {
              System.out.print(j);
           }
        }
        System.out.println();
     }

  }
```