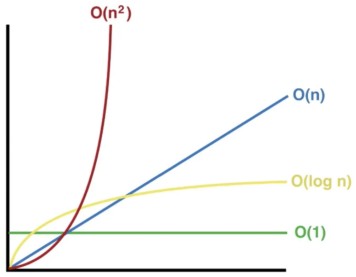
CSSE 220 – Object-Oriented Software Development
Rose-Hulman Institute of Technology

Worksheet 20

Name (Print):_____ Section:_____

1. The efficiency of an algorithm depends on two factors: _____ complexity and _____ complexity.
2. Select the **correct** statement for **time complexity**:
   (a) the number of times a particular instruction set is executed
   (b) the total time taken to execute the program
3. Consider the graph below. Provide the labels



   1) x-axis: _____ 2) y-axis: _____
4. Provide the order of the **four** time complexity families as input size increases:

   _____
5. Select the correct Big-O classification:
   (a) $3n^2$: $O(1)$ $O(n)$ $O(n^2)$
   (b) 1,000,000: $O(1)$ $O(n)$ $O(n^2)$
   (c) $2n^2 + n + 3$: $O(1)$ $O(n)$ $O(n^2)$
   (d) $\frac{n}{2} + n$: $O(1)$ $O(n)$ $O(n^2)$
6. Identify the Big-O time complexity

```
1 static int addNum(int n1,int n2){
2     int sum = n1 + n2;
3     return sum;
4   }
5 //BigO: ________________________
```

7. Identify the Big-O time complexity

```
 public int sum(int[] a) {
    int s = 0;
    for (int x : a) {
        s += x;
    }
    return s;
}
//BigO: _________________________
```

8. Identify the Big-O time complexity

```
public void twoPass(int[] a) {
    int sum = 0;
    for (int x : a) {
        sum += x;
    }
    for (int x : a) {
        System.out.println(x);
    }
}
//BigO: _________________________
```

9. Identify the Big-O time complexity

```
public void printAllPairs(int[] a) {
    for (int x : a) {
        for (int y : a) {
            System.out.println("(" + x + "," + y + ")");
        }
    }
}
//BigO: _________________________
```

10. Complete the table with an example for each Big-O category:

Big-O	**Example**
$O(1)$ $O(\log n)$ $O(n)$ $O(n^2)$	

11. **Before You Leave**

    Write one question you still have about today's topic.