Exam Set 11 thru 12E
AP Computer Science A

Name _____ Period_____

1. Write the following for-loops as while loops

(a)

```
int y;

for(y = 5; y < 10; y+=2)
{

    System.out.println(y);
}
```

(b)

```
for(int z = 10; z > 0; z--){

    System.out.println(z);

}
```

/4

2. What is the output for each code segment below,

(a)

```
int m = 0;
int j = 0;

do{
j *= -1;
     if(j >= 0){
   m += 2;
     }
j+=2;

}while(m < 4);

System.out.println(j);
```

(b)

```
int i = 5, j = 0;
do{

     for(j = 0; j < i; j++){
          System.out.print("*");
     }
     System.out.println();
     i--;

}while(i > 0);
```

/2



_____/13

3. The `Decrypt` class below accepts a number from the user and then converts the number to its character representation. Each pair of numbers in the provided number represent the ascii equivalent of a character and therefore can be used to identify the corresponding symbol.

In the example below, each pair of numbers in `num` map to a different symbol as shown,

| **num** | **pairs** | | | | | **ascii equivalents of pairs** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 8773846772 | 87 | 73 | 84 | 67 | 72 | W | I | T | C | H |

Write the `Decrypt` class below. The final string of characters should be stored in `String` called `result`,

```
public class Decrypt{

     public static void main(String args[]){

           int num = Integer.parseInt(args[0]);









     }
}
```

/5

Score _____/13

4. A mathematical sequence is an ordered list of numbers. This question involves a sequence called a *hailstone sequence*. If n is the value of a term in the sequence, then the following rules are used to find the next term, if one exists.

- If n is 1, the sequence terminates
- If n is even, then the next term is n/2
- If n is odd, then the next term is 3n + 1

For this question, assume that when the rules are applied, the sequence will eventually terminate with the term n = 1

The following are examples of hailstone sequences,

Example 1: 5, 16, 8, 4, 2, 1

- The first term is 5, so the second term is 5*3 + 1 = 16
- The second term is 16, so the third term is 16/2 = 8
- The third term is 8, so the fourth term is 8/2 = 4
- The fourth term is 4, so the fifth term is 4/2 = 2
- The fifth term is 2, so the sixth term is 2/2 = 1
- The sixth term is 1, so the sequence terminates

Example 2: 8, 4, 2, 1

- The first term is 8, so the second term is 8/4 = 4
- The second term is 4, so the third term is 4/2 = 2
- The third term is 2, so the fourth term is 2/2 = 1
- The fourth term is 1, so the sequence terminates.

The length of a hailstone sequence is the number of terms it contains. For example, the hailstone sequence in example 1 (5, 16, 8, 4, 2, 1) has a length of 6 and the hailstone sequence in example 2 (8, 4, 2, 1) has a length of 4.

In the space below are your algorithm which calculates the length of a hailstone sequence that starts with n.

Score _____/13

5. The CountFlips class below simulates how many flips it takes to achieve a specified streak of heads. Below are some examples,

| **Streak** | **Number of flips required to get 10 heads in a row** |
|---|---|
| 10 | 395 |
| 12 | 2648 |
| 15 | 93833 |

Complete the CountFlips class below.

Score _____/13