

CSE 142 Sample Midterm Exam #2

1. Expressions (10 points)

For each expression in the left-hand column, indicate its value in the right-hand column.

Be sure to list a constant of appropriate type (e.g., 7.0 rather than 7 for a double, Strings in quotes).

<u>Expression</u>	<u>Value</u>
$8 + 5 * 3 / 2$	_____
$1.5 * 4 * 7 / 8 + 3.4$	_____
$73 \% 10 - 6 \% 10 + 28 \% 3$	_____
$4 + 1 + 9 + "." + (-3 + 10) + 11 / 3$	_____
$3 / 14 / 7 / (1.0 * 2) + 10 / 6$	_____
$10 > 11 == 4 / 3 > 1$	_____

2. Parameters (20 points)

At the bottom of the page, write the output produced by the following program.

```
public class ParameterMystery {
    public static void main(String[] args) {
        String x = "happy";
        String y = "pumpkin";
        String z = "orange";
        String pumpkin = "sleepy";
        String orange = "vampire";

        orange(y, x, z);
        orange(x, z, y);
        orange(pumpkin, z, "y");
        z = "green";
        orange("x", "pumpkin", z);
        orange(y, z, orange);
    }

    public static void orange(String z, String y, String x) {
        x = x + "!";
        System.out.println(y + " and " + z + " were " + x);
    }
}
```

3. **While Loop Simulation, 15 points.** For each call of the method below, write the value that is returned:

```
public static int mystery(int i, int j) {
    int k = 0;
    while (i > j) {
        i = i - j;
        k += (i - 1);
    }
    return k;
}
```

<u>Method Call</u>	<u>Value returned</u>
mystery(2, 9)	_____
mystery(5, 1)	_____
mystery(38, 5)	_____
mystery(5, 5)	_____
mystery(40, 10)	_____

4. **Assertions, 15 points.** For the following method, identify each of the three assertions in the table below as being either ALWAYS true, NEVER true or SOMETIMES true / sometimes false at each labeled point in the code.

```
public static int mystery(Scanner console) {
    int y = 0;
    int z = 1;
    int next = console.nextInt();

    // Point A
    while (next >= 0) {
        // Point B
        if (y > z) {
            // Point C
            z = y;
        }
        y++;
        next = console.nextInt();
        // Point D
    }

    // Point E
    return z;
}
```

	next < 0	y > z	y == 0
Point A			
Point B			
Point C			
Point D			
Point E			

5. Programming, 15 points.

Write a static method named `computeGrade` that accepts an integer value representing a student's course percentage in the range 0 through 100 inclusive as a parameter and returns a real number indicating the student's grade in the course. The value returned should be as follows. Notice that the grades between 63 and 94 follow a pattern where the lowest number, 63, gets grade 0.8 and each percentage above 63 accounts for 0.1 more grade point.

Percentage	Grade Returned
0 - 59	0.0
60 - 62	0.7
63	0.8
64	0.9
65	1.0
66	1.1
...	...
92	3.7
93	3.8
94	3.9
95 and up	4.0

Sample Calls :

```
computeGrade(37) should return 0.0
computeGrade(61) should return 0.7
computeGrade(70) should return 1.5
computeGrade(86) should return 3.1
computeGrade(93) should return 3.8
```

6. Programming (15 points)

Write a static method named `threeHeads` that repeatedly flips a coin until three heads *in a row* are seen. You should use a `Random` object to give an equal chance to a head or a tail appearing. Each time the coin is flipped, what is seen is displayed (H for heads, T for tails). When 3 heads in a row are flipped a congratulatory message is printed. Here are possible outputs of four calls to `threeHeads`:

```
T T T H T H H H
Three heads in a row!
```

```
H H T T T H H T T H T H H T H H H
Three heads in a row!
```

```
T T T H H H
Three heads in a row!
```

```
T H T H T T T T H T H H H
Three heads in a row!
```