

CSE142 Midterm Key
Spring 2018

1.	Expression	Value
	<code>43 + 5 - 2 + 10 / 2</code>	51
	<code>3 - 1 + "3 - 1" + 1 + 3</code>	"23 - 113"
	<code>12 / 4.0 / 2 - 6 / (2 + 2) + 2</code>	2.5
	<code>(5 / 5 + 5 / 5 + 5 / 5 % 5) % 5</code>	3
	<code>(2 < 1 + 8 - 6) && !(4 != 5 6 > 7)</code>	false

2. The program produces the following output:

```
godel wrote grace with turing
borg wrote borg with boole
alan wrote hopper with lovelace
boole wrote boole with hopper
```

3.	Method Call	Output Produced
	<code>ifElseMystery(1, 8);</code>	3 8
	<code>ifElseMystery(3, 5);</code>	5 0
	<code>ifElseMystery(4, 5);</code>	5 6
	<code>ifElseMystery(8, 6);</code>	8 2
	<code>ifElseMystery(7, 7);</code>	7 8
	<code>ifElseMystery(5, 7);</code>	7 2

4.	Method Call	Output Produced
	mystery(4);	2 2
	mystery(5);	1 5
	mystery(24);	4 3
	mystery(28);	3 7

5.	x > 2	x < n	n % x == 0
Point A	Never	Sometimes	Sometimes
Point B	Sometimes	Always	Sometimes
Point C	Never	Sometimes	Sometimes
Point D	Always	Sometimes	Sometimes
Point E	Sometimes	Never	Sometimes

6. Two possible solutions appear below:

```
public static void selfCheckout(Scanner console, String saleItem, double discount) {
    System.out.print("How many items? ");
    int items = console.nextInt();
    double total = 0;
    double savings = 0;
    for (int i = 0; i < items; i++) {
        System.out.print("Item? ");
        String item = console.next();
        System.out.print("Price? ");
        double price = console.nextDouble();

        if (item.equals(saleItem)) {
            total += price * (1 - discount);
            savings += price * discount;
        } else {
            total += price;
        }
    }
    System.out.println("Final total (after discount): $" + total);
    double perc = discount * 100;
    System.out.println("The " + perc + "% discount on " + saleItem +
        " saved you $" + savings + "!");
}
```

```
public static void selfCheckout(Scanner console, String saleItem, double discount) {
    System.out.print("How many items? ");
    int items = console.nextInt();
    double total = 0;
    double savings = 0;
    for (int i = 0; i < items; i++) {
        System.out.print("Item? ");
        String item = console.next();
        System.out.print("Price? ");
        double price = console.nextDouble();

        if (item.equals(saleItem)) {
            savings += price * discount;
        }
        total += price;
    }
    System.out.println("Final total (after discount): $" + (total - savings));
    System.out.println("The " + (discount * 100) + "% discount on " + saleItem +
        " saved you $" + savings + "!");
}
```

7. One possible solution appears below:

```
public static int noBigger(int max) {
    System.out.println("Picking numbers from 1 - " + max);
    Random r = new Random();

    int roll = r.nextInt(max) + 1;
    int limit = max;
    int count = 0;
    while (roll <= limit) {
        count++;
        System.out.println("Number: " + roll);

        limit = roll;
        double chance = 1.0 * limit / max;
        System.out.println("Probability to continue: " + chance);
        roll = r.nextInt(max) + 1;
    }
    System.out.println("Number: " + roll + ", streak ends");
    return count;
}
```

8. One possible solution appears below:

```
public static int filter(int num, int d) {
    int result = 0;
    int multiplier = 1;
    while (num > 0) {
        int dig = num % 10;
        if (dig != d) {
            result += multiplier * dig;
            multiplier *= 10;
        }
        num /= 10;
    }
    return result;
}
```