

CSE 142 Sample Midterm Exam #4 Key

Also check out *Practice-It* to test solving these problems or to type in your own solution to see if it works!

1. Expressions

| <u>Expression</u> | <u>Value</u> |
|---|---------------|
| <code>5 * 2 * 4 - 3 * 3</code> | 31 |
| <code>29 / 4 / 2.0 + 18 / 5 + 1.5</code> | 8.0 |
| <code>30 % (4 + 3) + 16 % 20</code> | 18 |
| <code>!(23 + 2 * 2 <= 27) && 5 % 2 == 1</code> | false |
| <code>1 + 1 + "(8 - 2)" + (8 - 2) + 1 + 1</code> | "2(8 - 2)611" |

2. Parameter Mystery

10 is roughly 4 plus 3
5 is roughly 10 plus 3
17 is roughly 2 plus 6
3 is roughly 17 plus 40
3 is roughly 7 plus 4

3. If/Else Simulation

| <u>Method Call</u> | <u>Output</u> |
|---------------------------|---------------|
| <code>mystery(4);</code> | 4 7 |
| <code>mystery(30);</code> | 30 16 |
| <code>mystery(-6);</code> | -6 -13 |
| <code>mystery(18);</code> | 18 10 |
| <code>mystery(15);</code> | 15 8 |

4. While Loop Simulation

| <u>Method Call</u> | <u>Output</u> |
|-------------------------------|---------------|
| <code>mystery(-2, -6);</code> | 0 |
| <code>mystery(2, 3);</code> | 0 1 1 |
| <code>mystery(4, 8);</code> | 0 3 5 6 |
| <code>mystery(5, 40);</code> | 0 4 7 9 10 10 |
| <code>mystery(10, 31);</code> | 0 9 17 24 30 |

5. Assertions

| | <code>a != 0</code> | <code>c % 2 == 0</code> | <code>b > 0</code> |
|----------------|---------------------|-------------------------|-----------------------|
| Point A | SOMETIMES | ALWAYS | NEVER |
| Point B | ALWAYS | SOMETIMES | SOMETIMES |
| Point C | ALWAYS | NEVER | NEVER |
| Point D | SOMETIMES | SOMETIMES | SOMETIMES |
| Point E | NEVER | SOMETIMES | SOMETIMES |

6. Programming (two solutions shown)

```
public static String graduation(double gpa, int credits, int honorsCredits) {
    if (credits >= 180 && gpa >= 2.0) {
        if (honorsCredits >= 15 && gpa >= 3.8) {
            return "summa cum laude";
        } else if ((honorsCredits >= 15 && gpa >= 3.6) || gpa >= 3.8) {
            return "magna cum laude";
        } else if (gpa >= 3.6) {
            return "cum laude";
        } else {
            return "graduating";
        }
    } else {
        return "not graduating";
    }
}
```

```
public static String graduation(double gpa, int credits, int honorsCredits) {
    if (credits < 180 || gpa < 2.0) {
        return "not graduating";
    } else if (honorsCredits >= 15 && gpa >= 3.8) {
        return "summa cum laude";
    } else if (honorsCredits >= 15 && gpa >= 3.6 || gpa >= 3.8) {
        return "magna cum laude";
    } else if (gpa >= 3.6) {
        return "cum laude";
    } else {
        return "graduating";
    }
}
```

7. Programming (three solutions shown)

```
public static void cheerleader(int lines, int cheers) {
    for (int line = 0; line < lines; line++) {
        for (int space = 1; space <= line * 3; space++) {
            System.out.print(" ");
        }

        System.out.print("Go");
        for (int cheer = 2; cheer <= cheers; cheer++) {
            System.out.print(" Team Go");
        }
        System.out.println();
    }
}
```

```
public static void cheerleader(int lines, int cheers) {
    String indent = "";
    for (int line = 1; line <= lines; line++) {
        System.out.print(indent);
        for (int cheer = 1; cheer <= cheers - 1; cheer++) {
            System.out.print("Go Team ");
        }
        System.out.println("Go");
        indent += "    ";
    }
}
```

```
public static void cheerleader(int lines, int cheers) {
    for (int line = 1; line <= lines; line++) {
        for (int space = 1; space <= line - 1; space++) {
            System.out.print(" ");
        }
        for (int cheer = 1; cheer <= cheers - 1; cheer++) {
            System.out.print("Go Team ");
        }
        System.out.println("Go");
    }
}
```

8. Programming (three solutions shown)

```
public static void randomRects() {
    Random r = new Random();
    int last = 100;    // can also be 0
    int count = 0;

    while (count < 4) {
        int w = r.nextInt(10) + 1;
        int h = r.nextInt(10) + 1;

        System.out.println("w: " + w + ", h: " + h + ", area: " + w * h);

        if (last < w * h) {
            count++;
        } else {
            count = 1;    // need to count first rect in sequence
        }
        last = w * h;
    }
    System.out.println("Four rectangles of increasing area.");
}
```

```
public static void randomRects() {
    Random r = new Random();
    int a1 = 0, a2 = 0, a3 = 0, a4 = 0;
    while (a1 == 0 || a1 >= a2 || a2 >= a3 || a3 >= a4) {
        int w = r.nextInt(10) + 1;
        int h = r.nextInt(10) + 1;
        a1 = a2;
        a2 = a3;
        a3 = a4;
        a4 = w * h;
        System.out.println("w: " + w + ", h: " + h + ", area: " + a4);
    }
    System.out.println("Four rectangles of increasing area.");
}
```

```
public static void randomRects() {
    Random r = new Random();
    int area = 0;
    int last = 0;
    int count = 0;
    while (count != 4) {
        int w = r.nextInt(10) + 1;
        int h = r.nextInt(10) + 1;
        area = w * h;
        if (area <= last) {
            count = 1;
        } else {
            count++;
        }
        System.out.println("w: " + w + ", h: " + h + ", area: " + area);
        last = area;
    }
    System.out.println("Four rectangles of increasing area.");
}
```