1. **Define short circuiting and write an example in an if-statement code segment. (2pt)**

Short circuiting is when an "AND" operator is used in a statement and the left side (the side that is read first) is false. This makes the expression automatically false. Ex:

If(false && true) System.out.println("Hello");

Console Output:

nothing

2. **Why might it be a bad idea to do math with integers? What would be a better alternative to fix this issue? (2pt)**

Integers do not allow decimals, so a calculation like 5/3 would equal 1. Alternate solution would be using double that allow decimals.

3. **Java handles arithmetic with an order of operations. What is that order? (2pts)**

PEMDAS- Parenthesis, exponents, multiplication, division, addition, subtraction.

4. **What is the point of the break keyword in a switch statement? (2pt)**

Java continues to read the code and doesn't realize to end the case that it reads. That is if there are any more cases past the case it reads first. And the point of switch statement is to get one case and not multiple cases.

5. **Jason is attempting to calculate his grade percentage with a given numerator and denominator. However, when he tries to run his program, the result is always 0.0%. Why is this issue occurring? How might Jason fix his program to make the output accurate?**

```
public class Driver {
    public static void main(String[] args) {
        String name = "Jason";
        int numerator = 90;
        int denominator = 100;
        double grade = numerator / denominator;
        double percent = grade * 100.0;
```

```
            System.out.println(name + "'s grade is " + percent + "%");
        }
    }
```

Although his grade is declared as a double the numbers being divided are integers which don't allow decimals. To fix this issue you would have to declare numerator and denominator as a double. Or you can cast both the numerator and denominator as double.

Programming Assignment (10 pt)

Create a program that assigns a letter grade (A, A-, B+,…, F) depending on a double grade percentage greater than 0.0%. In this program you must do the following:

- Declare and initialize a double for the grade average

- Declare a character for the letter grade

- Choose some kind of conditional structure (if, else-if, else, switch)

- Have the conditional structure initialize the letter grade given the grade average

- Show the grade percentage and letter grade formatted as a print statement

Note: ***This should work for any number grade greater than 0% considering some assignments can have extra credit points making them worth more than 100%***