1 Question 1

Go through the program and trace the execution. What is the output after the program runs?

```
public class Autobots extends Transformers {
    public drive() {
        optimus(2001);
    }
    private void optimus(int y) {
        int x = y / 1000;
        int z = (x + y);
        x = bumblebee(z, y);
        System.out.println("bumblebee: s = " + x + ", y = " + y + ", z = " + z);
    }
    private int bumblebee(int x, int y) {
        int z = jazz(x + y, y);
        y = y / z;
        System.out.println("bumblebee: x = " + x + ", y = " + y + ", z = " + z);
        return z;
    }
    private int jazz(int x, int y) {
        y = x (x System.out.println("jazz: x = " + x + ", y = " + y);
        return y;
    }
}
```

jazz: x = 4004, y = 1001
bumblebee: x = 2003, y = 1, z = 1001
optimus: x = 1001, y = 2001, z = 2003

2 Question 2

```
public static boolean method1(int[] array, int target) {
	for (int i=0; i¡array.length;i++) {
		if (array[i] == target) return true;
		else if (array[i] ¿ target) return false;
	}
	return false;
}
public static boolean method2(int[] array, int target) {
	int low = 0;
	int high = array.length - 1;
	while (low ¡= high) {
		int mid = (low+ high) / 2;
		if (array[mid] == target) return true;
		else if (array[mid] ¡ target) low = mid + 1;
		else high = mid - 1;
	}
	return false;
}
int[] a = 2, 5, 11, 14, 15, 27, 31;
```

What does method1(a, 5) return?
True
What does method2(a, 20) return?
False
Explain what each of these methods do.
check that the variable 'target' is in the array passed in

3 Question 3

What is the value of x[0][0] after the following lines are executed?

```
public class Chocolate {
      public static void main(String[] args) {
            int[] y = {2, 5, 9};
            int[] [] x = {{5, 12, 10}, {8, 3, 2}, {7, 2, 1}};
            x[0] = y;
            y[1] = x[1][0];
            y[0] = x[0][1];
            x[0][0] = y[1];
            x[1] = y; int[][] z = new int[3][];
            z[0] = x[0];
            z[1] = x[1];
            z[0][0] = -z[0][0];
            z[0][0] = x[1][1];
      }
}
```

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