For problems 1-5, give a short answer to the question. (15 points, ~8 minutes)

1) (4 points) Write four Java statements that <u>declare</u> and <u>initialize</u> the following variables: A) a **long integer** with the value 12,345,678,900, B) a **String** object with the name of your favorite coffee shop, C) a **character** initialized to the dollar sign, and D) a **double** with the value 98.7654321.

```
long myLong = 12345678900L;
String myString = "Alley Cat";
char myChar = '$';
double myDouble = 98.7654321;
```

2) (4 points) Write <u>four</u> Java statements to A) create a **Scanner** to read from the console, B) print the prompt "Enter an integer: ", and C) read an **integer** value from the console into a previously declared **int** variable called *myInteger*, and D) close the **Scanner**.

```
Scanner keyboard = new Scanner(System.in);
System.out.print("Enter an integer: ");
myInteger = keyboard.nextInt();
keyboard.close();
```

3) (2 points) Write a <u>single</u> statement that prints a variable of type **double** called *myDouble*, which has already been declared and initialized, with exactly 4 digits after the decimal point, followed by a **newline** character.

```
System.out.printf("%.4f\n", myDouble);
```

4) (3 points) What is printed by the following statements?

```
double d0 = 2.3456, d1 = 1.2345;
boolean b = (d0 <= d1);

System.out.println (b);          FALSE

System.out.println (!b);          TRUE
```

5) (4 points) What is the value of the **boolean** variable *equals* after the following statement?

```
boolean b0 = true, b1 = false, b2 = false;

boolean equals = ((b0 && b1) || ! b2);     TRUE
```

For problems 6-10, show what the program shown below would print (3 points each, ~6 minutes).

```java
public class FirstProgram {

    public static void main(String[] args) {

        int i = 12;
        int j = 5;
        double d = 1.5;

        // Output for question 6
        System.out.printf("%.2f\n", j * d);

        // Output for question 7
        System.out.println(i % j * 3);

        // Output for question 8
        System.out.printf("%.1f\n", i + 3.0 * j);

        // Output for question 9
        System.out.println (i >= 11);

        // Output for question 10
        System.out.println ((i / j) * j + (i % j));
    }
}
```

6) **7.50**

7) **6**

8) **27.0**

9) **true**

10) **12**

For problems 11-15, show what the program shown below would print (3 points each, ~6 minutes).

```java
public class SecondProgram {

    public static void main(String[] args) {

        String first = "Computer";
        String last = "Science";

        // Output for question 11
        System.out.println(last.length() - first.length() + 5);

        // Output for question 12
        System.out.println(first.charAt(3));

        // Output for question 13
        System.out.println(last.indexOf('e'));

        // Output for question 14
        System.out.println(first.indexOf('x'));

        // Output for question 15
        System.out.println(first.substring(1,7));
    }
}
```

11)   4

12)   p

13)   3

14)   -1

15)   ompute

For problems 16-20, show what the program shown below would print (3 points each, ~6 minutes).

```java
public class ThirdProgram {
    public static void main(String[] args) {
        char c0 = '&', c1 = 'c', c2 = 'w', c3 = '7';
        boolean b = (c1 >= c2);
        if (b)
            c3 = '3';
        else
            c3 = '8';
        c2--;
        switch (c3) {
            case '3':     c0 = '*';
                          c1 = 'n';
                          break;
            case '7':     c0 = '$';
                          c1 = 'm';
                          break;
            case '8':     c0 = '#';
                          c1 = 'q';
                          break;
        }
        System.out.println(b);  // Output for question 16
        System.out.println(c0); // Output for question 17
        System.out.println(c1); // Output for question 18
        System.out.println(c2); // Output for question 19
        System.out.println(c3); // Output for question 20
    }
}
```

16)   false

17)   #

18)   q

19)   v

20)   8

For problems 21 and 22, write the Java code that is requested. **NOTE**: Many of the statements requested are to do calculations, not printing. You should not print anything in the code you write on this page **except when it is explicitly requested**! (15 points, ~9 minutes)

21) (7.5 points) Write a Java conditional statement that subtracts 6.7 from a previously declared double variable called *myDouble* if its value is between 7.0 and 12.5 inclusive, or multiplies *myDouble* by 1.2 if its value is greater than or equal to 17.8. Otherwise add 3.3 to *myDouble*.

```java
if  (7.0 <= myDouble && myDouble <= 12.5) {
        myDouble = myDouble – 6.7;
else if  (myDouble >= 17.8) {
        myDouble = myDouble * 1.2;
else
        myDouble = myDouble + 3.3;
```

22) (7.5 points) Write a Java **switch** statement that checks the value of a variable of type **char** named *someCharacter*, and increments (adds one to) an integer variable named *specialCharacters* if the variable has the value '!', '@', '#', '$', or '&', and increments an integer variable named *numberDigits* if the variable has the value '0' through '4', and prints "Character not recognized!" if the character is anything else. Assume all variables are previously declared.

```java
switch (someCharacter) {

   case '!': case '@': case '#': case '$': case '&':
        specialCharacters++;
        break;

   case '0': case '1': case '2': case '3': case '4':
        numberDigits++;
        break;

   default:
        System.out.println("Character not recognized!");
 }
```