Java 4_3

1. Write a program that will take in the base and height of a triangle and calculate and display the area of the triangle using the formula below. AA = 1 2 bbh

```
package helloworld;
import java.util.Scanner;
public class helloworld {


        public static void main(String[] args) {
              // TODO Auto-generated method stub
Scanner in = new Scanner(System.in);

        // Prompt user for base and height
        System.out.print("Enter the base of the triangle: ");
        double base = in.nextDouble();

        System.out.print("Enter the height of the triangle: ");
        double height = in.nextDouble();

        // Calculate the area
        double area = 0.5 * base * height;

        // Display the area
        System.out.println("The area of the triangle is: " + area);

        in.close();
    }
}
```

```
Problems  Javadoc  Console ×
<terminated> helloworld (1) [Java Application] C:\Users\ASUS\.p2\pool\plu
Enter the base of the triangle: 3
Enter the height of the triangle: 5
The area of the triangle is: 7.5
```

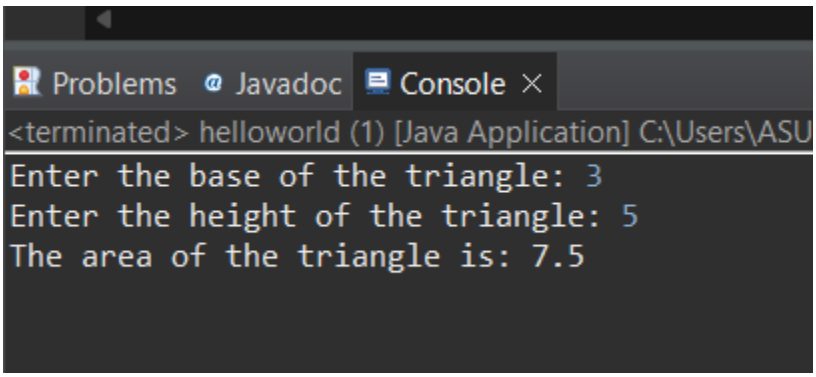
2. Write the following math formulas in Java. You will need to use methods from the Math class as well as nesting of methods and parentheses to force the order of operations to correctly calculate the answer. Assume that all the variables in the formulas have already been declared and initialized. a. aa = √xx5−6 4 b. bb = $xxyy$ − 6xx c. cc = 4$cccccc$(zz 5) − $sssssssxx$2 d. dd = xx4 − 6xx − yy3 e. ee = 1 yy− 1 xx−2yy f. ff = 7($cccccc$(5 − $ssssss$√3xx − 4))

package helloworld;

import java.util.Scanner;

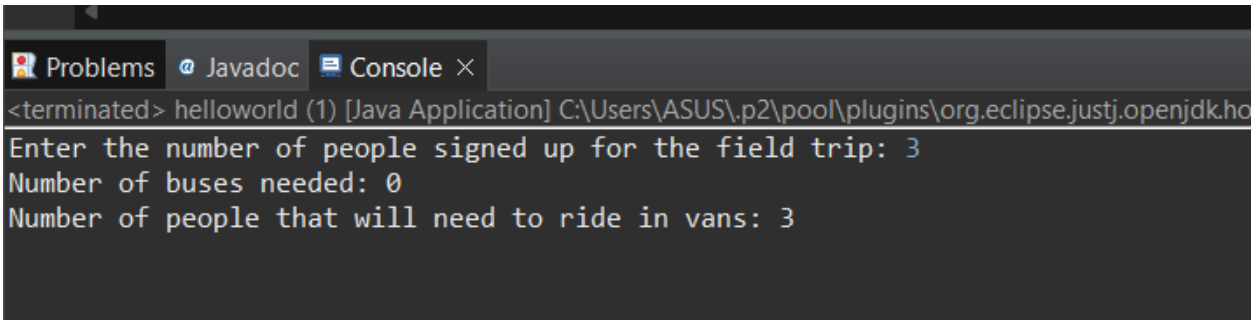
public class helloworld {

```
public static void main(String[] args) {
        // TODO Auto-generated method stub
         Scanner in = new Scanner(System.in);

    // Prompt user for base and height
    System.out.print("Enter the base of the triangle: ");
    double base = in.nextDouble();

    System.out.print("Enter the height of the triangle: ");
    double height = in.nextDouble();

    // Calculate the area
    double area = 0.5 * base * height;

    // Display the area
    System.out.println("The area of the triangle is: " + area);

    in.close();
  }
}
```



3. A bus holds 45 people. The school will only use a bus if they can fill it completely. The rest of the people will ride in vans. Write a program that will take in the number of people that are signed up to go on a field trip. Have the program print the number of busses necessary and then total number of people that will need to ride in vans.

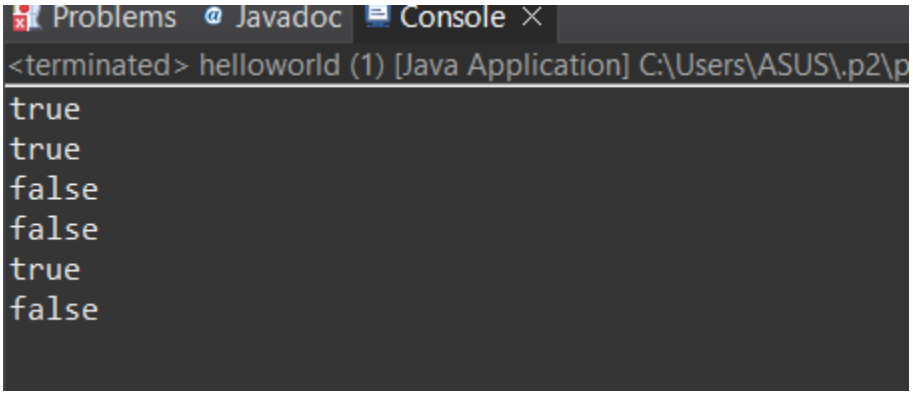
```
package helloworld;

import java.util.Scanner;

public class helloworld {



	public static void main(String[] args) {

		// TODO Auto-generated method stub
Scanner in = new Scanner(System.in);


	// Prompt user for the number of people

	System.out.print("Enter the number of people signed up for the field trip: ");

	int people = in.nextInt();


	// Calculate the number of buses needed

	int busCapacity = 45;

	int busesNeeded = people / busCapacity;

	int peopleInVans = people % busCapacity;


	// Print the results

	System.out.println("Number of buses needed: " + busesNeeded);

	System.out.println("Number of people that will need to ride in vans: " + peopleInVans);


	in.close();

  }

}
```



4. Write true or false on the blanks in the program below to show the value of the boolean variable true_false as the program executes. int i=5; int j=6; boolean true_false; true_false=(j3); _____ true_false=(j<=5); _____ true_false=(6j || true_false && j>=4); _____ true_false=(!(i

```
package helloworld;


public class helloworld {

   public static void main(String[] args) {

      int i = 5;

      int j = 6;

      boolean true_false;


      true_false = (j < 5); // false

      System.out.println(true_false); // Output: false


      true_false = (j > 3); // true

      System.out.println(true_false); // Output: true


      true_false = (j < i); // false

      System.out.println(true_false); // Output: false


      true_false = (i < 5); // false

      System.out.println(true_false); // Output: false


      true_false = (j <= 5); // false
```

```
        System.out.println(true_false); // Output: false

        true_false = (6 < 6); // false
        System.out.println(true_false); // Output: false

        true_false = (i != j); // true
        System.out.println(true_false); // Output: true

        true_false = (i == j || i < 50); // true
        System.out.println(true_false); // Output: true

        true_false = (i == j && i < 50); // false
        System.out.println(true_false); // Output: false

        true_false = (i > j || true_false && j >= 4); // false
        System.out.println(true_false); // Output: false

        true_false = (!(i < 2 && j == 5)); // true
        System.out.println(true_false); // Output: true

        true_false = !true_false; // false
        System.out.println(true_false); // Output: false
    }
}
```



5. Explain why each of the declarations in the second list are wrong.

boolean gameOver = false; int students=50,classes=3; double sales_tax; short number1;

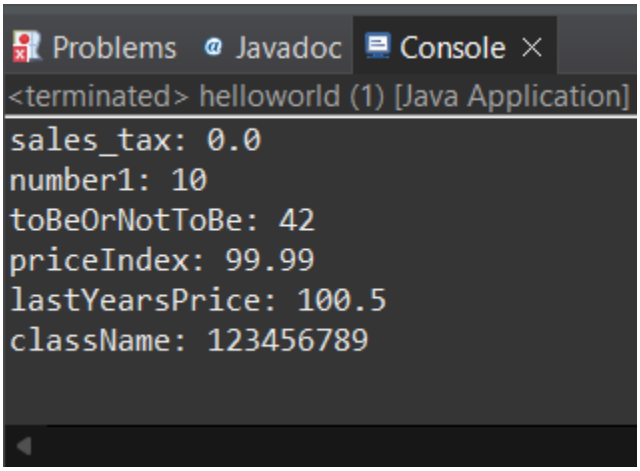
int 2beOrNot2be; float price index; double lastYear'sPrice; long class;

package helloworld;

```
public class helloworld {
    public static void main(String[] args) {
            boolean gameOver = false;
        int students = 50, classes = 3;
        double sales_tax = 0.0; // Initialized to avoid compilation error
        short number1 = 10; // Initialized to avoid compilation error

        // Corrected variable names
        int toBeOrNotToBe = 42; // Initialized to avoid compilation error
        float priceIndex = 99.99f; // Initialized to avoid compilation error
        double lastYearsPrice = 100.50; // Initialized to avoid compilation error
        long className = 123456789L; // Initialized to avoid compilation error

        // Print statements to show the values
        System.out.println("gameOver: " + gameOver);
        System.out.println("students: " + students);
        System.out.println("classes: " + classes);
```

```
        System.out.println("sales_tax: " + sales_tax);
        System.out.println("number1: " + number1);
        System.out.println("toBeOrNotToBe: " + toBeOrNotToBe);
        System.out.println("priceIndex: " + priceIndex);
        System.out.println("lastYearsPrice: " + lastYearsPrice);
        System.out.println("className: " + className);
    }
}
```

output



6. Explain why each of the declarations in the second list do not follow conventions for variable names.
int cadence=3, speed=55, gear=4; final double SALES_TAX=.06; double gearRatio=.5; int currentGear=5;

int c=3,s=55,g=4; final double salesTax=.06; double gearratio=.05,Gear=4; int current_gear;

```
package helloworld;


public class helloworld {
    public static void main(String[] args) {
            int cadence = 3, speed = 55, gear = 4;
        final double SALES_TAX = 0.06;
        double gearRatio = 0.5;
        int currentGear = 5;
```

```
        // Print statements to show the values
        System.out.println("cadence: " + cadence);
        System.out.println("speed: " + speed);
        System.out.println("gear: " + gear);
        System.out.println("SALES_TAX: " + SALES_TAX);
        System.out.println("gearRatio: " + gearRatio);
        System.out.println("currentGear: " + currentGear);
    }
}
```