NAME: ____________________________________________________________________________

Instructions
1. Do all of the 4 problems
3. You have 50 minutes for the exam
4. Show all your work
5. Do not separate midterm papers
1. (25 pts) What is printed by the following program? Show all your work for partial credit.

```java
public class PrintMethodCalls {
    public static void main(String[] args) {
        System.out.println("main method begins");
        methodA();
        methodA();
        methodB();
        System.out.println("main method ends");
    }
    public static void methodA() {
        methodB();
        System.out.println(" o ");
        System.out.println(" /|\ ");
        System.out.println(" / \ ");
    }
    public static void methodB() {
        System.out.println("------------");
    }
}
```

Solution:

```
main method begins
------------
   o
   /\\
  / \
------------
   o
   /\\
  / \
------------
main method ends
```
2. (25 pts) What is printed by the following program? Show all your work for partial credit.

```java
public class ForLoop {
    public static void main(String[] args) {
        int j=0,i=2;
        System.out.println(j*j + " "+i);
        for (j=1; j<10; j=j+2) {
            System.out.println(j*j + " "+i);
            i=i+1;
        }
        System.out.println(j*j + " "+i);
    }
}
```

Solution:

0 2
1 2
9 3
25 4
49 5
81 6
121 7
3. (25 pts) Write a complete program to compute the volume of a sphere given its radius. Read the radius from the user. Compute the volume and print it. Sample execution of the program is given below.

Enter radius
1.1
Volume = 5.572453333333335

The formula for computing the volume of a sphere is given below. Use 3.14 for \( \pi \) in your program.

\[
volume = \frac{4}{3} \pi \times radius^3
\]

Solution:

```java
import java.util.*;
public class SphereVolume {
    public static final Scanner CONSOLE = new Scanner(System.in);
    public static void main(String[] args) {
        double radius, volume;
        System.out.println("Enter radius");
        radius=CONSOLE.nextDouble();
        volume = 4.0/3*3.14*radius*radius*radius;
        System.out.println("Volume = "+volume);
    }
}
```
4. (25 pts) The following program uses **nested for loops** to print the table given below. Complete the program.

```
2 3 4 5 6 7
3 4 5 6 7 8
4 5 6 7 8 9
5 6 7 8 9 10
6 7 8 9 10 11
7 8 9 10 11 12
```

Solution:

```java
public class NestedTable {
    public static void main(String args[]) {
        int i, j;
        for (i = 1; i <= 6; i++) {
            for (j = 1; j <= 6; j++) {
                System.out.print(j + i + " ");
            }
            System.out.println();
        }
    }
}
```