

[May use one side of an 8.5 × 11 inch sheet of paper] Show all of your work clearly in the space provided or on the additional page at the end of the exam. If the additional page is used, clearly identify to which exam question it is related. Be sure to **read each problem carefully**. Note that the exam is double sided.

1. (10 points) List three methods of the `Math` class and indicate what must be passed to each and what each returns.

2. (10 points) Precisely explain the difference between a class and an object in Java. Give an example of each.

3. (10 points) Precisely explain the difference between identifier creation and object creation. Show Java code for an example of each.

4. (15 points) Show one line of Java code that will create an identifier called `number` and convert the following `String` into its floating point representation.

```
String numberString = "55.764";
```

5. (30 points) Implement the `main` method (don't need to include the entire contents of the `.java` file) that asks the user to enter an integer value and displays the square of the number entered. For example, if the user entered 4, the program should display: **The square of 4 is 16.** All user I/O should be done on the console (`System.in/System.out`).

6. (25 points) The value of π can be approximated by the series

$$4\left(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \dots\right)$$

Using this formula, write a program that calculates and displays an estimate for π using the first four terms of the series.

The output should be displayed in a pop-up window. You must include the entire contents of the .java file.



Additional work area for any problem. Clearly identify to which problem the work on this page is related.



Additional work area for any problem. Clearly identify to which problem the work on this page is related.