

Show all of your work clearly in the space provided or on the additional page at the end of the exam. **read each problem carefully**. Note that the exam is double sided.

1. (10 points) Precisely describe the differences between primitives and objects (reference variables).

2. (5 points) Draw the symbol used to represent a decision in a flowchart.

3. (5 points) Write the symbol used to determine if two operands are equal.

4. (10 points) Write the following mathematical expression as a legal Java expression (assume that x, y, and z are `doubles`):

$$z = \frac{1}{2} + \frac{1}{xy}$$

(b) (5 points) Suggest how the program could be fixed so that it would operate as intended.

6. (10 points) Assume the following declarations:

```
int i;  
double d;  
float f;  
long l;
```

Identify which, if any, of the following statements would compile without error. Rewrite any remaining statements so that they no longer cause a compiler error.

1. `i = d;`
2. `l = f;`
3. `l = i;`
4. `d = i;`
5. `d = f;`

7. (20 points) Complete the program below. See the comments for what the program should do.

```
import javax.swing.JOptionPane;

/**
 * The following program asks the user to enter the price of a hamburger
 * and displays the number of pennies required to purchase the burger.
 *
 * Example program interaction:
 *
 *     Enter the price of a hamburger: $1.29
 *     It would take 129 pennies to purchase that burger.
 */
public class Exam7 {

    public static void main(String [] args) {

        String answer = JOptionPane.showInputDialog("Enter the price of a hamburger: $");

    }
}
```

8. (20 points) Complete the following program. The program must ask the user to enter **desiredNumber** numbers, where **desiredNumber** is entered by the user. The program should then display the sum of all the numbers entered.

Sample program run:

```
How many numbers would you like to evaluate? 2
Enter a number: 1.2
Enter a number: 2.4
The sum of all the numbers entered is: 3.6
```

```
public class Exam8 {
    public static void main(String [] args)
    {
        System.out.println("How many numbers would you like to evaluate?");
        Scanner in = new Scanner(System.in);
        int desiredNumber = in.nextInt();
```

```
    }
}
```



Additional space — indentify which problem your work is associated with.