Show all of your work clearly in the space provided. Be sure to **read each problem carefully**. Note that the exam is double sided. Look over the entire exam before starting. Be sure to pace yourself.

1. (10 points) Match the term/expression on the left with the most appropriate item on the right.

____ Unary operator	1. String
____ Binary operator	2. (int)Math.PI
____ Typecast	3. 5
____ Character literal	4. '5'
____ Primitive type	5. "5"
____ Reference type	6. a++
____ Compiler	7. System.out.println()
____ Automatic type promotion	8. double x = 5;
____ Equality	9. i = 5;
____ Comment	10. int i;
	11. ==
	12. =
	13. javac
	14. /* i = 5; */
	15. "This" + " looks " + "interesting";
	16. char

2. (5 points) Given two variables: String name and `int` value, display an initialization of an `int` with the specified name and value. For example, if name contains "number" and value contains "5", your code snippet should display **int number = 5;**.

3. (10 points) Describe how bytecode makes Java programs portable.

4. (5 points) Define identifier **scope** and describe the implecation to identifiers declared within an `if` block.

5. (10 points) In your week 4 lab you needed to continue looping as long as the estimate for π was outside of the error range. Given estimate contains your estimate of π and error contains the error threshold for the maximum allowed error, provide the boolean expression that should go in the conditional for the `do`-while statement below.

```
do {
    // increments the width and updates the estimate of pi
while (BOOLEAN EXPRESSION);
```

6. (10 points) Indicate what will be displayed by each of the following lines of code. If the code will instead cause an error, indicate that.

```
System.out.println(2 + 2 / (3 - 5));
```

```
System.out.println(8 % 4);
```

```
System.out.println(Character.isDigit('m'));
```

```
System.out.println(!false && "true".length() < 0);
```

```
System.out.println((int)Double.parseDouble("2.7"));
```

.

7. (5 points) What is the result of the following code? Explain your answer.

```
String phrase = "If you think the world revolves around you,";
String fraze = "you must be very dense.";
if (phrase.length() < fraze.length()) {
    System.out.println(phrase.charAt(0) + phrase.substring(6, phrase.indexOf("the")));
} else {
    System.out.println(fraze.charAt(2) + fraze.substring(fraze.indexOf("se")));
}
```

8. (10 points) Rewrite the following `for` loop as a `while` loop.

```
for (int count = 0; count < 10; count++) {
  System.out.println(10 - count);
}
```

9. (15 points) Complete the program below that asks the user to enter a negative integer followed by a positive double. You may assume that the user always enters a valid integer followed by a valid double. Repeatedly prompt the user until they enter the correct values and then display the difference between the two numbers.

```
public class Exam9 {
  public static void main(String[] args) {
    int negativeNum;
    double positiveNum;
    Scanner in = new Scanner(System.in);

    System.out.println("The absolute difference between the entered numbers is "
                       + (positiveNum - negativeNum));
  }
}
```

10. (20 points) Complete the program below. Recall that Character.isDigit(char a) returns `true` if a is a digit.

```
/**
 * A program that asks the user to enter a long sequence of characters. The program
 * then displays the number of times three neighboring characters are a sequence of
 * three consecutive digits that increase in magnitude.
 * Examples:
 *   INPUT          -> OUTPUT | Increasing sequences
 * - "123a234"      -> 2      | "123" and "234"
 * - "zk122man0"    -> 0      | none
 * - "123-0489"     -> 3      | "123", "048", "489"
*/
public class Exam10 {
  public static void main(String[] args) {
    System.out.println("Please enter a long sequence of digits");
    Scanner in = new Scanner(System.in);
```

```
    System.out.println("There were " + count + " sequences of increase digit triplets");
  }
}
```