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Name: _____

Signature: _____

1. (12 points) Indicate whether each of the following statements is true or false:

- i. _____ `public`, `static`, `void`, and `main` are all examples of Java Language Keywords.
- ii. _____ In the Java statement `x = input.nextInt();` `nextInt` is the name of a method.
- iii. _____ A variable's scope ends at the closing brace of the code block in which it is declared.
- iv. _____ Java will automatically do both widening and narrowing conversion of data values.
- v. _____ Comments can be used by the Java compiler to help find logic errors in a program.
- vi. _____ Variable names (local to a method) should always begin with a lowercase letter.

2. (12 points) Choose the best answer to each of the following:

- i. _____ When testing code written in Java, you should
 - a) use the compiler to catch runtime errors
 - b) use the interpreter to catch syntax errors
 - c) both of the above
 - d) neither of the above
- ii. _____ In order to run, a Java application must have
 - a) a method named `main`
 - b) a class named `main`
 - c) inline comments
 - d) integer variables
- iii. _____ When calling a method, the arguments are
 - a) the variables in the declaration
 - b) the values passed to the method
 - c) both of the above
 - d) neither of the above
- iv. _____ The assignment operator is used to
 - a) declare the type of a variable
 - b) combine two data values
 - c) store a value in memory
 - d) determine the remainder

3. (12 points) Vocabulary Matching

- | | |
|------------------|--|
| _____ address | A) A basic element of code, such as a word or symbol. |
| _____ constant | B) The order in which certain operations are evaluated. |
| _____ literal | C) Newlines, tabs, and other “invisible” characters. |
| _____ operator | D) A “final” variable that can be assigned only one time. |
| _____ portable | E) The storage location of a variable or object in memory. |
| _____ precedence | F) A symbol that represents a computation like addition. |
| _____ token | G) The ability to run on more than one kind of computer. |
| _____ whitespace | H) An actual value written directly in the source code. |

4. (15 points) Write a Java statement that:

- i. Declares count to be an integer variable.

- ii. Declares happy to be a method that returns a boolean and has a single integer parameter that represents a score.

- iii. Assigns 19.99 to a previously declared variable named price.

- iv. Declares and assigns the constant CM_PER_INCH to be 2.54.

- v. Calls the happy method, passing the argument 85 and assigning the result to a previously declared variable named okay.

5. (12 points) Evaluate the following expressions, and indicate the data type and value of the result. Write ERROR in both columns if there is a syntax error.

	Type	Value
-5 + 1		
(double) -(5 / 4)		
1 + 6 + " is " + 3 + 4		
15 % 4		
"Hello" * 2		
(9 / 2.0) * 2		

6. (15 points) What is the output of the following program? (It compiles and runs without error.)

```
public class Shapes {
    public static void main(String[] args) {
        System.out.println("R1: " + rectangleArea(300, 10));
        System.out.println("R2: " + rectangleArea(20, 400));
        System.out.println("R3: " + rectangleArea(20, 20));
    }
    public static int rectangleArea(int width, int length) {
        int area;
        area = width * length;
        return 10;
    }
}
```

Draw a stack diagram to show the contents of memory just before rectangleArea returns for the first time. (You may leave the box for the args parameter empty.)

7. (12 points) Complete the following method. You may assume that no trip lasts for 24 hours or more. You may also assume that the parameters are all correct and reasonable (i.e., that milesEnd is greater than or equal to milesStart).

```

/**
 * Computes a car's average speed over the length of a trip.
 *
 * @param milesStart odometer reading at the start of the trip
 * @param milesEnd odometer reading at the end of the trip
 * @param hrsStart hours on the (24 hour) clock at the start
 * @param minsStart minutes on the clock at the start
 * @param hrsEnd hours on the (24 hour) clock at the end
 * @param minsEnd minutes on the clock at the end
 * @return the average speed (in miles per hour)
 */
public static double averageSpeed(double milesStart, double milesEnd,
    double hrsStart, double minsStart, double hrsEnd, double minsEnd) {

}

```

8. (10 points) Complete the following table based on the averageSpeed method above. (You may assume that the method works properly, even if you were unable to answer the previous question.)

milesStart	milesEnd	hrsStart	minsStart	hrsEnd	minsEnd	return
15000	15030	14	15	14	45	
15000	15030	14	45	15		60.0
80100	80175		0	3	0	75.0
80005	80015	1	30	2	0	
60000	60010	7		7	30	40.0