

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 explain what the following line of Java code does. Draw a picture that shows what happens in memory as a result of this line of code.

```
int i = 7;
```

2. (10 points) Precisely explain what the following line of Java code does. Draw a picture that shows what happens in memory as a result of this line of code.

```
String word = "Relax";
```

3. (10 points) Write the following mathematical expression in Java:

$$x = \frac{1 + y}{3z}$$

4. (10 points) Given

```
String text = "Why do fools fall in love? To reproduce and outnumber us.";
```

Determine the result of each of the following expressions:

(a) `text.substring(0, 4);`

(b) `text.length();`

6. (10 points) Rewrite the following `switch` statement as a sequence of `if/else` statements that produce the equivalent functionality.

```
String input = JOptionPane.showInputDialog("Enter an integer"); // don't copy
int num = Integer.parseInt(input); // don't copy
String answer = "Visualize"; // don't copy
switch(num) {
    case 0:
        answer = "whirled";
        break;
    case 2:
    case 4:
        answer = "peas";
        break;
    default:
        answer = "now";
}
```

7. (25 points) Complete the following program that asks the user to enter three integers and displays “No number is the sum of the other two numbers.” if it is not possible to add two of the numbers entered in order to get the third. Otherwise, the program displays “__ + __ = __”. For example, if the user enters 1, 3, and 2, the program should display either: “1 + 2 = 3” or “2 + 1 = 3”.

```
import java.util.Scanner;
```

```
public class Exam {
```

```
    public static void main(String[] args) {  
        System.out.println("Please enter three integer values");
```



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