Name _____ **CSE 8B** **PID** _____

VERSION A

Quiz 4

Winter 2016 **Signature** _____

This quiz is to be taken **by yourself** with closed books, closed notes, no electronic devices. *Write your name on the answer sheet too!*

Problem 1 (3 points):

Fill in the blanks to implement a recursive function which returns the **n^th^ Fibonacci number**. A Fibonacci sequence can be written as follows:

n	1	2	3	4	5	6	7	8	9
Fib No.	1	1	2	3	5	8	13	21	34

This means that `fibonacci(4) = 3, fibonacci(7) = 13` and so on. Assume that n is always bigger than 0. The Fibonacci sequence follows a pattern where any number in the sequence always equals the sum of the previous two numbers. This pattern starts at position 3. The 1st and 2nd positions both equal 1.

```
public static int fibonacci(int n)
  {
    if(_____a._____)
    {
      _____b._____
    }
    else
    {
      _____c._____
    }
  }
```

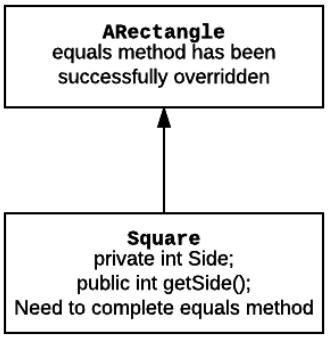
a. n <= 1

b. return n

c. return fibonacci(n-2)+fibonacci(n-1)

Problem 2.1 (3 points):

In PSA 7, the equals method for the Square class is overridden. Each **`Square`** object contains an int instance field called **`side`** indicating the length of a square's edge. The **`Square`** class also has a **`getSide()`** access method that returns the value of the side of the calling object. The following diagram shows part of the inheritance relationship in PSA7. **`Square`** class inherits from the **`ARectangle`** class.



You can assume that the **`equals`** method in the **`ARectangle`** class has been overridden properly. Complete the **`equals`** method below for **`Square`** class so it correctly overrides the equals method to have a deep comparison. You should use the getter method to access instance fields.

```
public boolean equals(___a.___ o){//fill in the type of
                                  // parameter o

   if( ____b.____){//check if the object pointed by
                   //o is a Square.

      if(____c._____){//compare the object pointed by o and
                      //the calling object. Deep comparison
        return true;  //two objects have the same values
      }
   }
   return false; //two objects have different values.
}
```

Problem 2.2 (2 points):
Consider an interface Bob defined as follows:

```
public interface Bob{…}
```

Write "Error" in your answer sheet if a statement gives a compile error. If not write "No error". The two statements below are not sequential to each other.

```
a. Bob b = new Bob();          _____________________________________

b. Bob b;                      _____________________________________
```

Problem 3 (7 points):
Given the following definitions:

```
public interface Drawable {
  public abstract String draw();
}
```

```
public class Shape implements Drawable {
  private static final String
       DRAW_SHAPE = "Drawing shape";

  public Shape() {
    // ctor initialization here
  }

  public String draw () {
    return DRAW_SHAPE;
  }

  public String getColor() {
    return "blue";
  }
}
```

```
public class Polygon extends Shape implements
Drawable {
  private static final String
              DRAW_POLYGON = "Drawing Polygon";
  private int sides;

  public Polygon() {
    this.sides = 5;
  }

  public String draw() {
    return DRAW_POLYGON;
  }

  public int getSides() {
    return sides;
  }
}
```

What gets printed by the following statements? If a statement causes a compile error or run time error, clearly indicate if it is a compile error or run time error. **Statements a. to g. are not sequential to each other**. Statements a. to g. will execute after the following three statements.

```
Shape shape = new Shape();
Polygon polygon = new Polygon();
Drawable drawable = polygon;
```

```
a. System.out.println(((Polygon)drawable).getSides());   //_____________a._____________

b. System.out.println(drawable.draw() );                 //_____________b._____________

c. System.out.println(drawable.getColor() );             //_____________c._____________

d. System.out.println(((Shape)drawable).getColor());     //_____________d._____________

e. System.out.println(shape.getColor() );                //_____________e._____________

f. System.out.println(shape.draw() );                    //_____________f._____________

g. System.out.println(polygon.draw() );                  //_____________g._____________
```

Scratch Paper

Scratch Paper

CSE 8B Quiz -4 Answer Sheet Name_____ PID_____

Problem 1:

VERSION A

a. _____

b. _____

c. _____

Problem 2.1:

VERSION A

a. _____

b. _____

c. _____

Problem 2.2:

VERSION A

a. _____

b. _____

Problem 3:

VERSION A

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

g. _____