CS163/CS164 – Review Worksheet Name________________________________

1. Write exactly what this program will print after the main is executed.

```
public interface Shape {
    int getWidth ();
    int getLength ();
    int getArea ();
}

public abstract class AbstractShape implements Shape {
    private int width;
    private int length;

    public int getWidth() {
        return width;
    }

    public int getLength() {
        return length;
    }

    public void setWidth(int val) {
        width = val;
    }

    public void setLength(int val) {
        length = val;
    }

    public AbstractShape(int width, int length) {
        setWidth(width);
        setLength(length);
    }

}

public class Rectangle extends AbstractShape{

    public Rectangle(int width, int length) {
        super(width, length);
    }

    public int getArea() {
        return getLength()*getWidth();
    }

    public String toString() {
        return String.format("Rectangle: width: %d, length: %d, area: %d", getWidth()
, getLength(), getArea());
    }
}
```

```
public class Triangle extends AbstractShape {
    private double angle;

    public int getArea() {
        return (getWidth()*getLength())/2;
    }

    public double getAngle() {
        return angle;
    }

    public void setAngle(double val) {
        angle = val;
    }

    public Triangle(int base, int height) {
        this(base, height, 90.0);
    }

    public Triangle(int base, int height, double angle) {
        super(base, height);
        setAngle(angle);
    }

    public String toString() {
        return String.format("Triangle: base: %d, height: %d, angle: %.2f, area: %d",
                getWidth(), getLength(), getAngle(), getArea());
    }

}

public class Square extends Rectangle {
    public Square(int side) {
        this(side, side);
    }

    private Square(int width, int length) {
        super(width, length);
    }
}

public class Main24 {
    public static void main(String[] args) {
        List<Object> shapes = new ArrayList<>();
        shapes.add(new Rectangle(10, 2));
        shapes.add(new Square(5));
        shapes.add(new Triangle(5, 2));
        shapes.add(new Triangle(5, 2, 23.33333));
        shapes.add(new Rectangle(20, 2));
        for(Object obj : shapes) System.out.println(obj);
 }

}
```

2. Given the following code, what is printed?

```
private static int doSomething(int[] arr) {
  int val = 0;
  for(int i = 0; i < arr.length; i+=1) {
      val += arr[i];
  }
  return val + arr.length;
}
public static void main(String[] args) {
  int[] arr = new int[10];
  arr[0] = 10;
  arr[1] = 2;
  arr[0] = 1;
  arr[2] = 20;
  arr[3] = 4;
  arr[8] = 6;
  System.out.println(doSomething(arr));
}
```

3. Given the following code, what type of sort does it perform?

```
void sort(int arr[]) {
        int n = arr.length;
        for (int i = 0; i < n-1; i++) {
            for (int j = 0; j < n-i-1; j++) {
                if (arr[j] > arr[j+1])  {
                    int temp = arr[j];
                    arr[j] = arr[j+1];
                    arr[j+1] = temp;
                }
            }
        }
}
```

Hint: come up with an array, and quickly run/write down each pass to see what it is doing.

4. Given the following output, write a code that generates this output.

```
Print 1: [Anna, Matt]
Print 2: [Anna]
Print 3: [Anna, James]
Print 4: [Maria, Anna, Denny, James]
```

5. What is printed?

```
    public static boolean stringCheck(String s) {
        if (s.length() <= 1)
            return true;
        if (s.charAt(0) == s.charAt(s.length() - 1))
            return stringCheck(s.substring(1, s.length() - 1));
        return false;
    }

    public static void main(String[] args) {
        System.out.println(stringCheck("anna"));
  }
```

6. Which line in the following code would cause a compile error:

```
public class Hero {
    public static final String LEAGUE = "HERO"; // Option A

    public String powerLookup(int which) {
        String rtn = LEAGUE + ": Flight"; // Option B
        if (which < 0) {
            rtn = LEAGUE + ": Laser Eyes"; // Option C
        }
        return rtn;
    }

    public static void main(String[] args) {
        System.out.println(Hero.LEAGUE); // Option D
         Hero.LEAGUE = "Villain"; // Option F

        Hero ajax = new Hero();
        System.out.println(ajax.powerLookup(-1));
  }

}
```