2017F Java Test #2 B Name:_____

1. (30 points) Write a class Cubic to represent a 3rd order polynomial $p_3(x)=ax^3+bx^2+cx+d$ that makes the following main work:

```
public static void main(String[] a) {
  Cubic c1 = new Cubic(1, 2.5, -1.5, 3); // x^3+2.5x^2-1.5x+3
  Cubic c2 = new Cubic(3,-1.0,2.4); // 3x^2-x+2.4
  System.out.println(c2.eval(2)); // evaluate c2(2) = 3*2^2-2+2.4
  Cubic c3 = c1.add(c2); // add the two polynomials
  Cubic c4 = c1.neg(); //c4 = -c1
  System.out.println(c4); // print out -x^3-2.5x^2+1.5x-3.
}
```

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2. (10 points) Complete the missing code and show the output of main.

```
public interface B {
  public void g();
}
public class A implements B{
  private int y;
  public B(int y) { this.y=y }
  public void f() { System.out.println("A");
  public String toString() { // should print "A y=5" whatever y is
     return "A y="+y ;
  }
}

public class C extends A {
  private int x;
// you must initialize the parent x value!!!
  public C(int x, int y) { this.x=x ; super(y) }
  public void f() { System.out.println("C"); super.f(); }
  public String toString() { // print "A y=2 C x=1"
     return super.toString + "C x=" + x ;
  }
  public static void main(String[] a) {
    C c1 = new C(1,2);
    System.out.println(c1);
    c1.f();
  }                    Show the output: A y=2 C x=1
                                        C
                                        A.
}
```

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3. *(30 points)*Write the exact output of the following code

```
class A {
  private static int count = 0;
  public A() { System.out.print('m');}
  public void A() { System.out.println('n'); }
  public String toString() { return "p"; }
  public void f() { System.out.println('q'); }
  public static int getCount() { return count; }
  public void finalize() { System.out.println('r'); }
}

class B extends A {
  public B() { this(2); System.out.print('s'); }
  public B(int r) {
    System.out.println('t');  System.out.println(getCount());
  }
  public void B() { super.A(); System.out.print('u'); }
}

public class Test2_2017F {
  public static void f() {
    B b1 = new B(3);
    System.out.println("-" + b1 + "-");
    A a1 = new A();
  }
  public static void main(String[] args) {
    f();
    System.out.println(A.getCount());
    System.gc();
    System.out.println(A.getCount());
  }
}
```

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4. (30 points) Write a class Rect which contains x,y,width and height and implement so the following main works. You may assume that processing's PApplet has method ellipse(...)

```
public static void main(String[] args) {
  PApplet a = new Papplet() ;// just imagine you have a working
processing window here.
  Rect r1 = new Rect(300,200, 100,50);  // top-left
corner=(300,200)
  System.out.println(c1);  // print out the circle
  c1.draw(a); // draw the circle on your PApplet window.
}
```

class Rect

private int x, y, L, W;

public Rect (int x, int y, int L, int W)

this.x = x;
y = y;
; ;

public String toString(){

return "x=" x, "y=" ----.

public void draw (PApplet a). {

a.rect (x, y, L, W).