ICS H22 Homework 1
Fall 2004

Due: 3:00PM, Monday October 4, 2004

1. Suppose that the class `Math` in the Java API had a constant defined for c (the speed of light in meters per second) which can be used with the expression `Math.C`. Show what the declaration for this variable would look like within the class `Math`. (You can use $c = 299792458.0$).

2. Give a fragment of code which will allocate an array of ten instances of class Point (given below) and initialize their values to x=1 and y=1.

```
public class Point {

    double x, y;

    public void setX( double newX )
    {
        x = newX;
    }

    public void setY( double newY )
    {
        y = newY;

    }
}
```

3. What is the output of a call to the method `scopingTest` in the code below? (By the way, in general, it's not a great idea to re-use variable names as is done in this code. This can create confusion as evidenced below.)

```
public class Scoping  {

     String s = "Pear";

     private void stringMethod1( )
     {
       System.out.println(s);
       s = "Kumquat";
     }

     private void stringMethod1(String s)
     {
       System.out.print(s);
       s = "Banana";
     }

     private void stringMethod2( )
     {
       String s = "Apple";
       System.out.println(s);
       s = "Pineapple";
     }


     public void scopingTest( )
     {

       String s = "Orange";

       stringMethod1( );
       stringMethod1( s );
       stringMethod1( );
       stringMethod2( );
       stringMethod1( );
       System.out.println( s );
       System.out.println( this.s );

     }
}
```

4. What is the output of the function `test()`?

```
class TestParameterPassing
{
    public void test()
    {
        int[] a = new int[ 10 ];
        int[] b = new int[ 10 ];

        for ( int i = 0; i < a.length; i++ )
        {
            a[ i ] = i;
            b[ i ] = -i;
        }

        System.out.println( a[ 2 ] );
        change1( a );
        System.out.println( a[ 2 ] );
        change2( a[ 2 ] );
        System.out.println( a[ 2 ] );
        change3( a );
        System.out.println( a[ 2 ] );
        a = b;
        System.out.println( a[ 2 ] );
    }

    public void change1( int[] b )
    {
        for ( int i = 0; i < b.length; i++ )
            b[ i ] = b[ i ] * b[ i ];
    }

    public void change2( int b )
    {
        b = b * b;
    }

    public void change3( int[] b )
    {
        int[] a = new int[ b.length ];

        for ( int i = 0; i < b.length; i++ )
            a[ i ] = b[ i ] * b[ i ];
        b = a;
    }
}
```