Last Name	Your last name here
First Name	Your first name here
Student Number	Your student number here
Circle Your Instructor	**Ferworn** **Harley**

Instructions:

(a) There are 4 questions on this test . The test is worth 35% of your final mark.

(b) There is a time limit of 50 minutes.

(c) Write your answers on this test and on the blank sheets provided in pen only.

(d) Make sure you put your name and student # on everything

(e) Clearly identify which question you are answering.

(f) Please include comments to explain what you are doing.

(g) There are 8 versions of this test randomly distributed in the class…Do not attempt to copy from another paper.

1)   (9 marks) A year with 366 days is called a leap year. A year is a leap year if it is divisible by 4 (for example, 1980). However, since the introduction of the Gregorian calendar on October 15, 1582, a year is not a leap year if it is divisible by 100 (for example, 1900); however, it is a leap year if it is divisible by 400 (for example, 2000).

Write a boolean method in Java (not a whole class) that accepts an int argument called "year" and returns true if the year is a leap year and false otherwise. The method beginning is given below:

```
public boolean isLeapYear(int year)
{
// your code goes here

    public static boolean isLeapYear(int year)
    {
        if(year%400 == 0)return true;
        if(year%100 == 0)return false;;
        if(year%4 == 0)return true;
        return false;
    }
```

2)   (8 marks: 1/2 mark per error spotted, 1/2 mark per correct explanation) The following Java class is stored in a file called "Test2.java". The program does not make sense semantically but that is not the point of this question.

In the space provided, refer to the line number a syntax error occurs on and explain why it is a syntax error. Note that a mark will be deducted for each wrong answer. There are 8 errors and there could be more than one on a line.

```
 1: public class test2
 2: {
 3:   public static void main(String[] args)
 4:   {
 5:         int first = 2 + 2;
 6:         double second = 6.0;
 7:         int third;
 8:
 9:         third = fist + (int) second
10:
11:         System.out.println(first + second + third);
12:         for(int i=0; i<> first; i++)
13:              System.out.println("I love"
14:              + " Java");
15:         { // this is a block }
16:         while(i<first)
17:         {
18:              System.out.println("I can't print 'i'");
19:              brake;
20:         }
21:         first = first + (((((((((1)))))))));
22:         );
23:   }
24:
```

Space Provided:

Line Number	Syntax Error Explanation
	Errors in Yellow

3) (9 marks) Write a class called "Shoe" and another called "ShoeDriver" that creates a single object of class "Shoe". A Shoe object has 1 instance variable named "tied". The class has one constructor method that sets the value of "tied" to false. The class has another method named "untied" that sets the value of "tied" to false. The class has another method named "tie" that sets the value of "tied" to true. There is a final method named tiedStatus that returns the value of "tied". Use the space provided.

```java
public class Shoe
{
      //your code goes here


      private boolean tied;

      public Shoe()
      {
            tied = false;
      }

      public void untied()
      {
            tied = false;
      }

      public void tie()
      {
            tied = true;
      }

      public boolean tiedStatus()
      {
            return tied;
      }

}

public class ShoeDriver
{
      public static void main(String[] args)
      {
            // Your code goes here
            Shoe aShoe = new Shoe();

      }
}
```

(9 marks) Write a lottery number generator that creates 6 random integers between 1 and 49. the program should output the message "Use these numbers, they are as good as any others".

Use the Random class and its nextInt method. Recall that nextInt(n) returns a random number from 0 to n-1.

The lottery numbers that will you print can repeat but under no circumstances can you allow the numbers 6, 8 or 34 to be printed and the sum of the six numbers cannot be allowed to add up to exactly 75.

```java
import java.util.Random;
public class Lottery
{
    public static void main(String[] args)
    {
        System.out.println("Use these number, they are as good as any others");
        int count = 0;
        int num;
        int sum =0;
        Random generator = new Random();
        while(count < 6)
        {
            num = 1 + generator.nextInt(48);
            if(num == 6) continue;
            if(num == 8) continue;
            if(num == 34) continue;
            if(sum + num == 75) continue;
            sum = sum + num;
            count++;
            System.out.println(num);
        }
    }
}
```

Use this page if you need extra space.