Midterm Examination 1
CS170: Introduction to Computer Science

Observe the Emory College Honor Code while taking this test.

Question 1. (30 pts)

1. What is the name of the package in the Java library that is imported automatically by the Java compiler.

2. What is the name of the phenomenon where you can interpret the same statement in 2 different and correct ways ?

3. What values will the variable i assume in the body of the following loop statement:

```
for ( int i = 4; i < 13; i += 3 )
{
    ...
}
```

   Answer:

4. Give 3 types of loop statements in Java.

5. Give the definition of the "life time of a variable" ?

6. Give the definition of the "scope of a variable" ?

7. What is the range of the scope of a class variable ? (In other words: where in a Java program can you access a class variable)

8. What is the range of the scope of a parameter variable ? (In other words: where in a Java program can you access a parameter variable)

9. What parameter passing mechanism is used in the Java programming language ?

10. What is the other popular parameter passing mechanism that is not available in Java ?

Question 2. (10 pts)

You are given the Java program:

```java
public class Question2
{
   static int x = 10000;

   public static void main( String[] args )
   {
      {
         {
            System.out.println( "1:  x = " + x );
            String x = "abc";
            System.out.println( "2:  x = " + x );
         }
         System.out.println( "3:  x = " + x );
      }

      for ( int x = 6; x <= 6; x++ )
         System.out.println( "4:  x = " + x );

      System.out.println( "5:  x = " + x );
   }
}
```

For each of the System.out.println statement, state whether it will result in a compiler error message. If it does not result in an error message, then give the value that will be printed by the System.out.println statement.

```
1.  Error / No error        If no error:     x =

2.  Error / No error        If no error:     x =

3.  Error / No error        If no error:     x =

4.  Error / No error        If no error:     x =

5.  Error / No error        If no error:     x =
```

3

Question 3. (10 pts)

You are given the Java program:

```
public class Question3
{
   public static int f( int x, int y )
   {
      x++;
      y--;

      return ( x + y );
   }


   public static void main( String[] args )
   {
      int x, y, z;

      x = 1;
      y = 2;
      z = Question3.f( x, y );

      System.out.println( "x = " + x );
      System.out.println( "y = " + y );
      System.out.println( "z = " + z );
   }
}
```

Questions:

- If the parameters x and y are passed by **value**, what will be printed by the program:

    x =

    y =

    z =

- If the parameters x and y *could be* passed by **reference**, what will be printed by the
  program:

    x =

    y =

    z =

Question 4 (25 pts)

Define a class method named `minOfFive` inside the class `Question4` below that has 5 `double` types parameter variables `a`, `b`, `c`, `d` and `e` and returns the *minimum* of the 5 values in the parameter variables.

```
public class Question4
{



}
```

Question 5 (25 pts)

An integer number x ($x > 0$) is a prime number if the divisors of x are 1 and x. For example, the number 7 is prime because the divisors of 7 are: 1 and 7. Notice that the number 1 is a divisor of every integer number; and the number x is a trivial divisor of itself (x). In other words:

- an integer number x is a prime number if none of the numbers 2, 3, 4, ..., $x - 1$ is a divisor of x.

Question:

- Write a class method isPrime(int x) in the following class Question5 that returns true when x is a prime number, and returns false otherwise.

```
public class Question5
{
   public static boolean isPrime( int x )
   {




      }
}
```