Java Programming   Name _____

Practice Test 4 - Inheritance and Recursion   Date _____ Period _____

1) Trace the recursive stack for the method call.

a)

```
public int RollingStone(int i, int j)
{
        System.out.println(j);
        if (j > 1)
              return RollingStone(i, j-1) + i;
        else
              return i;
}
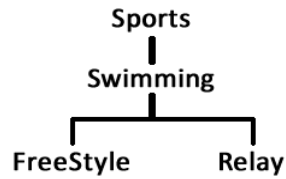```

Method Call: `RollingStone(9, 4)`          Recursive Trace.

b)

```
public int Round(int x)
{
        if (x % 4 > 0)
              return Round(x - 3) + Round(x - 1);
        else
              return 4;
}
```

Method Call: `Round(7)`   Recursive Trace:

2) You are writing a class `Sports` with subclass `Swimming` and it has two subclasses, `FreeStyle` and `Relay`. The class hierarchy chart is below.

```
              Sports
                |
            Swimming
          ┌─────────┐
      FreeStyle      Relay
```

The Sports class is defined below.

```
class Sports
{
   public boolean team;  // is it a team sport?
   public Sports()
   {
      team = false;            // default: not a team sport
   }
}
```

a) Define the `Swimming` class. Instructions for each line are given on the right.

```
_____         // define Swimming as subclass of Sports
{
   private int distance;

   _____(int distanceIn) // define Swimming constructor and
   {                                      // pass distance
      _____              // call the constructor of the parent class

      distance = _____ ;    // set distance to the passed parameter
   }
   public _____ getDistance()    // return the distance value
   {
      _____
   }
}
```

b) Define the `FreeStyle` and `Relay` subclasses. Instructions for each line are given on the right.

```
class FreeStyle _____      // define FreeStyle as a subclass of Swimming
{
   public FreeStyle()              // FreeStyle constructor
   {
      _____        // call parent class constructor and
                                                 // set distance to 100 meters
   }
}

class _____      // define Relay as a subclass of Swimming
{
   public Relay()                  // define Relay constructor
   {
      _____        // call parent class constructor and
                                                 // set distance to 400 meters

      _____                // set boolean team to true
   }
}
```

c) Write a main method that uses these classes to print out the following.

```
% java SportsTester
FreeStyle 100 meters
Relay 400 meters   Team Sport
```