This quiz is to be taken **by yourself** with closed books, closed notes, no electronic devices.

What is the output produced by the following program? (Hint: draw stack frames)

```java
public class Swap
{
  private int a;

  public Swap( int a )
  {
    this.a = a;
  }

  public void swap( int a, int b )
  {
    int tmp;

    tmp = a;
    a = b;
    b = tmp;
  }

  public void swap( Swap ref )
  {
    int tmp;

    tmp = this.a;
    this.a = ref.a;
    ref.a = tmp;
  }

  public static void swap( Swap ref1, Swap ref2 )
  {
    Swap tmp;

    tmp = ref1;
    ref1 = ref2;
    ref2 = tmp;
  }

  public static void main( String[] args )
  {
    int a = 11;  Swap ref1;
    int b = 22;  Swap ref2;

    ref1 = new Swap(9);
    ref2 = new Swap(3);

    Swap.swap( ref1, ref2 );
    System.out.println( ref1.a );
    System.out.println( ref2.a );


    ref1 = new Swap(9);
    ref2 = new Swap(3);

    ref1.swap( a, b );
    System.out.println( a );
    System.out.println( b );


    ref1 = new Swap(9);
    ref2 = new Swap(3);

    ref1.swap( ref2 );
    System.out.println( ref1.a );
    System.out.println( ref2.a );
  }
}
```

```
Output
┌─────────────────────────────┐
│ Output                      │
│                             │
│                             │
│                             │
│                             │
│                             │
│                             │
│                             │
│                             │
│                             │
│                             │
│                             │
│                             │
└─────────────────────────────┘
```

The different swap() method definitions have the same name but differ in their formal parameters. This is an example of method

_____

What is the initial value of each array element in the following arrays?

```
Boolean[] b = new Boolean[3];        _____        double[] d = new double[4];        _____

int[] a = new int[5];                _____        boolean[] c = new boolean[7];      _____
```

Given the following array declaration:

```
int[] a = { 1, 1, 2, 3, 5, 8, ... }; // You do not know how many values are in the initializer list
```

Fill in the blanks to print out each element:

```
for ( int i = _____ ; i < _____ ; _____ )

  System.out.println( _____ );
```

Now do the same using a foreach (enhanced for) loop:

```
_____ ( int i _____ _____ )

  System.out.println( _____ );
```

Now do the same using a while loop (any loop variable change do on a separate line):

```
_____

while ( _____ )
{
    _____

    _____

}
```

Now do the same using a do-while loop (you can assume there is at least one element in the array):
                                   (any loop variable change do on a separate line)

```
_____

_____
{
    _____

    _____

} _____ ;
```

In general, if you override the equals() method you should also override the _____ method.

Write the code to check for exact type equivalence between two objects referenced by variables o1 and o2:

```
if ( _____ )
  System.out.println( "o1 and o2 reference the exact same type of object" );
else
  System.out.println( "o1 and o2 reference different types of objects" );
```

Which is the only Java data structure than can hold primitive data types (like int) while all other standard Java data structures can only hold an object type? _____

What is Rick's favorite Java operator? _____