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 main( String[] args )
  {
    int a = 15;
    int b = 20;

    Swap ref1 = new Swap(5);
    Swap ref2 = new Swap(10);

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

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

Output

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

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

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

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( _____ );
```

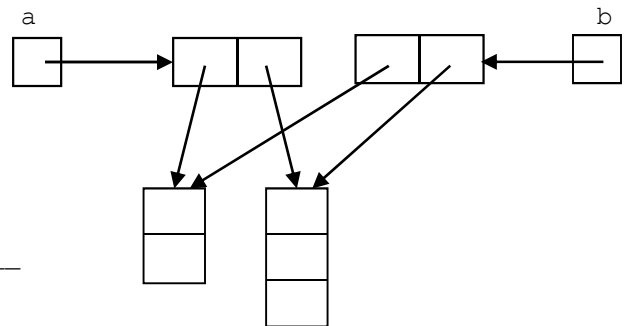Now do the same using a foreach (enhanced for) loop:

```
_____ ( int i _____ _____ )

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

Now do the same using a while loop:

```
_____

while ( _____ )
{

    _____

    _____
}
```

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

Given the following diagram of an array of array:

What is the output from the following:

```
System.out.println( a == b ); _____

System.out.println( a[0] == b[0] ); _____

System.out.println( a.equals(b) ); _____

System.out.println( a[0].equals(b[0]) ); _____

System.out.println( b.length ); _____

System.out.println( b[1].length ); _____
```

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" );
```