1. Trace through the following code segments and illustrate the output and memory.

	Memory	Output
a) int a = 3; int b = 9; System.out.println(b); a = b + 2; a = a + b; System.out.println(b+3); System.out.println(a);	● a: 3 ● b: 9	9 12 21
b) int ans = 10; int res = 6; int num; num = ans + res; System.out.println(num + 2); res = num + 3; System.out.println(res);	● ans: 10 ● res: 6 ● num: 16	18 19

c) int a, b, c; double d, e, f; a = 10; b = 4; d = a; c = a / b; e = a / b; f = e / b; a = a + 2 * b; d = b – d *2; System.out.println(a);
System.out.println(b);
System.out.println(c);
System.out.println(d);
System.out.println(e);
	● a: 18
	● b: 4
	● c: 2
	● d: -12.0
	● e: 2.0
	● f: 0.5
		18
		4
		2
		-12.0
		2.0

d) int num1, num2, num3; String s1, s2, s3; num1 = 10; num2 = 20; num3 = num1 + num2; s1 = “10”; s2 = “20”; s3 = s1 + s2; System.out.println(num3 + “=” + num1 + num2); System.out.println(s3 + “=” + s1 + s2);	● num1: 10 ● num2: 20 ● num3: 30 ● s1: "10" ● s2: "20" ● s3: "1020"	30=1020 1020=102020

2. To switch the values contained in the variables x and y, a programmer wrote the following segment:

```
x = y;
y = x;
```

a) If, before execution of the segment, x contains the value 7 and y contains the value 4, what value would each have after the segment was performed?

Before the segment:

- x: 7
- y: 4

After the first line (x = y;), the values are switched:

- x: 4
- y: 4

Then, after the second line (y = x;), both x and y end up with the value that was originally in y:

- x: 4
- y: 4

So, after the segment, both x and y will have the value 4.

b) Rewrite the segment so that it performs the intended task correctly.

```
//Should use a temporary variable to store one of the values during the swap.
// Temporary variable to store the value of x
int temp = x;

// Assign the value of y to x
x = y;

// Assign the original value of x (stored in temp) to y
y = temp;
```

Reference for questions 2 Carter, John. An Introduction To Computer Science Using Java. Toronto: University of Toronto Press, 200