This worksheet is for your use during and after lecture. It will not be collected or graded, but I think you will find it a useful tool as you learn C++ and study for the exams. Explain all false answers for the "True or False" questions; in general, show enough work and provide enough explanation so that this sheet is a useful pre-exam review. I will be happy to review your answers with you during office-hours, via Email, or instant messaging.

1. Match the C++ operators with the correct relational or Boolean description at the right

`%`	J	`<<`	J
`=`	J	`>>`	J
`>=`	F	`!`	G
`&&`	H	`||`	I
`++`	J	`<=`	E
`<>`	J	`%=`	J
`<`	C	`@`	J
`>`	D	`!=`	B
`==`	A	`><`	J

A is equal to
B is not equal to
C is less than
D is greater than
E is less than or equal to
F is greater than or equal to
G logical inverse or NOT
H logical intersection or AND
I logical union or OR
J Not a C++ relational or Boolean operator.

2. State the value (true or false) of each Boolean expression. One of them is buggy, and probably doesn't reflect the logic the programmer intended – which is it?

   (a) `(( 1 == 1 ) || ( 2 != 3 ))` True

   (b) `(( 1 < 1.01 ) && ( 2 > 3 - 2 ))` True

   (c) `( 1 <= 3 <= 1 )` True

   (d) `( 2<=2 && 3==1 )` False

   Solution: `c` is buggy, the programmer wants to write `(1<=3) && (3<=1)`. This is a contrived example, Usually this type of error is written in code like this: `1 <= x <= 3`, where the programmer wants to test $x \in [1,3]$. But for what values of `x` is this true or false? Does it really test what the programmer intended? Also, note that `b` and **??** are evaluated the same, since the parenthesis in `b` do not change the order of operations.

3. Which of the following represents an instruction *sequence* in C++?

   A. A single C++ statement *except* for a lone `;` on a line.

   B. 1 or more C++ statements *including* a lone `;` on a line.

   C. More than one C++ statement.

   Solution: B

4. C++, like many programming languages, has *selection statements* or *selection structures*. Explain precisely what they "select" in a program.

   Solution: They select a sequence of instructions for the CPU to follow, also known as the *code path*.

5. What will be printed on the console by the code below? Use the chart at the right to record changes in variable values.

```
1  int x(9), y(7), z(2), k(0);
2  double m(1.1), j(0);
3
4  if (x > y) {
5      if (y > z && y > k) {
6          m--;
7      } else {
8          k++;
9      }
10 } else {
11     j++;
12 }
13
14 cout << "m=" << m << endl;
15 cout << "k=" << k << endl;
16 cout << "j=" << j << endl;
```

Line #	x	y	z	k	m	j

Solution:

```
m=0.1
k=0
j=0
```