Lecture 9: Conditionals Worksheet

1) What is the **value** returned by the following expressions?

```
(2 + 5) * (6 - 4)          _______      2 + 5 * 8          _______
max(1/2, min(-1*3, 1-3))   _______      9 / 3 > 1 + 2      _______
0.5 != -0.5                _______      'h' == 'H'         _______
```

2) What is the **data type** of the value returned by the following expressions? Assume the variables `x` and `y` are defined as `float`. Check the Processing Reference (online) for functions that you don't know.

```
sqrt(x)          _______      abs(x) != sq(y)    _______
!false           _______      floor(0.1 * y)     _______
```

3) The **modulus** operator (`x % y`) returns the *remainder* of `x` divided by `y`. What value is returned by the following expressions?

```
0 % 3   _______      6 % 3    _______      -2 % 3   _______
2 % 3   _______      8 % 3    _______      -4 % 3   _______
4 % 3   _______      10 % 3   _______      -6 % 3   _______
```

4) Type the following into Processing and press Play. Explain what you see.

```
void draw() {
  background(0, frameCount % 255, 0);
}
```

5) Fill in the following *truth tables* for the logical operators given `boolean x` and `y`:

NOT (`!`)

x	!x
false	
true	

OR (`||`)

x	y	x || y
false	false	
false	true	
true	false	
true	true	

AND (`&&`)

x	y	x && y
false	false	
false	true	
true	false	
true	true	

6) What is the **value** returned by the following expressions?

```
true || false                 _______      true && true && false      _______
!(true == false)              _______      (3 >= 1) && (3 < 10))      _______
```

For the following questions, we will use *static* Processing code (*i.e.* no `setup()` or `draw()`). Start a new Processing file and add the following code. Make sure that the canvas is blue when you press Play.

```
int x = 120;
if ( x > 0 ) {
  background(0, 0, 255);
}
```

7) Change the initial value of `x` in your code so that the canvas no longer turns blue. What value of `x` did you use and what color is the canvas now?

   `x`: _____ canvas color: _____

8) Now add another `if` clause after the first `if` clause so that the canvas turns **red** instead of the color you saw in Question 7. Press Play to verify that it works now (changing `x` back to 120 should revert the canvas to blue).

9) Now add another `if` clause after all your other code that turns the canvas **green** if `x` is less than or equal to `-2`. Predict what color the canvas will be for the following values of `x` and then verify in Processing:

x	canvas color
-3	
-2	
-1	
0	
1	