Chapter 3 – Program Statements - AP

<u>Chapter Objectives</u>

- Discuss basic program development steps.
- Define the flow of control through a program.
- Learn to use if statements.
- Define expressions that let us make complex decisions.
- Learn to use while and for statements.

Chapter Overview: This chapter deals with program structure and control. As a part of this chapter you should become familiar with both decision and looping structures and the process of decomposing a problem to decide where these structures are necessary. The use of flow charts and syntax diagrams are used throughout the text and can be integrated into this chapter as a visual representation of the processes for students. Also you need to be able to recognize situations where loops and decision structures are necessary.

Multiple Choice: 3.1 – 3.10

True False: 3.1 – 3.9

Short Answer: 3.1 – 3.16, 3.18 – 3.21

AP Multiple Choice: 3.1 – 3.6

Worksheets: DeMorgan's Law

Programming Projects: 3.3, 3.5, 3.7, 3.10, 3.13, 3.14

Name:_____

Demorgan's Law

!(A && B) == !A || !B

!(A || B) == !A && !B

1.   Write an equivalent statement for the following:

    a. `!(age < 18)`
    b. `!(temperature >= 32)`
    c. `!(a <= b)`
    d. `!(money == happiness)`
    e. `!(time != 5)`

2.   The expression `!((m < n) || (m != 5))` is equivalent to which of the following:

    a. `(m < n) && (m != 5)`
    b. `!(m < n) || !(m != 5)`
    c. `(m > n) && (m == 5)`
    d. `(m >= n) && (m == 5)`
    e. `(m <= n) || !(m == 5)`

3.   The expression `(king != 3) && (queen != 4)` is equivalent to which of the following:

    a. `(king != 3) || (queen != 4)`
    b. `!((king == 3) && (queen == 4))`
    c. `(king == 3) || (queen == 4)`
    d. `!((king == 3) || (queen == 4))`
    e. `!((king == 3) && (queen == 4))`

4.   Rewrite the following line of code using one of DeMorgan's Laws:

```
while (!(x < y && count <= 0))
```

    _____

5.   Rewrite the following line of code using one of DeMorgan's Laws:

```
if (num < 1 && w != temp)
```

    _____