3) (10 pts) ALG (AVL Trees)

a) Show the result of inserting 37 into the following AVL tree:

```
        84
      /    \
    25      106
   /   \       \
 12    39      212
        /
      30
```
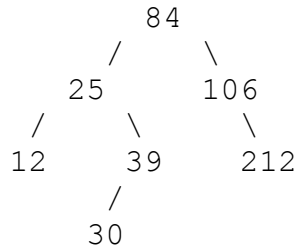
b) Using big-oh notation, give the **best-case** runtime for inserting a new element into an AVL tree with *n* nodes:

c) Using big-oh notation, give the **worst-case** runtime for inserting a new element into an AVL tree with *n* nodes:

d) Using big-oh notation, give the **best-case** runtime for inserting a new element into a binary search tree with *n* nodes:

e) Using big-oh notation, give the **worst-case** runtime for inserting a new element into a binary search tree with *n* nodes:

Computer Science Foundation Exam

January 12, 2019

Section II A

ALGORITHMS AND ANALYSIS TOOLS

**NO books, notes, or calculators may be used,
and you must work entirely on your own.**

Name: _____

UCFID: _____

NID: _____

Question #	Max Pts	Category	Passing	Score
1	10	ANL	7	
2	5	ANL	3	
3	10	ANL	7	
TOTAL	25		17	

You must do all 3 problems in this section of the exam.

Problems will be graded based on the completeness of the solution steps and <u>not</u> graded based on the answer alone. Credit cannot be given unless all work is shown and is readable. Be complete, yet concise, and above all <u>be neat</u>. For each coding question, assume that all of the necessary includes (stdlib, stdio, math, string) for that particular question have been made.