**Homework 5**

Question 1

Question 1a

50

20 60

10 40 70

15 30 65 80

25 35 75

Question 1b

50

20 60

15 40 70

25 65 80

35 75

Question 1c

In order: 10 15 20 25 30 35 40 50 60 65 70 75 80

Pre order: 50 20 10 15 40 30 25 35 60 70 65 80 75

Post order: 15 10 25 35 30 40 20 65 75 80 70 60 50

Question 2

Question 2a

7

3 5

1 2 4

Question 2b

7 3 5 1 2 4

Question 2c

5 3 4 1 2

Question 3

Question 3a

struct Node {

int data;

Node\* parent;

Node\* leftChild;

Node\* rightChild;

};

Question 3b

insert(Node\* node, Node\* root)

if root is NULL, set node to root and node’s parent pointer to NULL

else if node’s value == root’s value

return;

else if node’s value < root’s value

if root has no left child

set root’s left pointer to node

set node’s parent pointer to root

else pass in root’s left child as root in recursive call to insert

else if node’s value > root’s value

if root has no right child

set root’s right pointer to node

set node’s parent pointer to root

else pass in root’s right child as root in recursive call to insert

Question 4

Question 4a

O(C+S)

Question 4b

O(logC+S)

Question 4c

O(logC+logS)

Question 4d

O(logS)

Question 4e

O(1)

Question 4f

O(logC+S)

Question 4g

O(SlogS)

Question 4h

O(ClogS)