Bradley Zhu

304627529

**CS 32 Homework**

1.a.

50

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20 60

/ \ \

10 40 70

\ / / \

15 30 65 80

/ \ /

25 35 75

b. 50

/ \

15 60

/ \ \

10 40 70

/ / \

35 65 80

/ /

25 75

c. **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

2. a.

7

/ \

3 5

/ \ /

1 2 4

b. [7,3,5,1,2,4]

c. [5,3,4,1,2]

3. a. struct node {

node\* parent;

node\* left;

node\* right;

int value;

};

b.

void insert(Node \*insertThis, Node\* root) {

if the root is nullptr:

Set root = insertThis;

if root’s value is greater than insertThis’s value:

if root.left is null:

root.left = insertThis;

inserThis’s parent = root;

return;

otherwise:

insert(insertThis, root.left);

return;

else if root’s value is less than insertThis’s value:

if root.right is null:

root.right = insertThis;

inserThis’s parent = root;

return;

otherwise:

insert(insertThis, root.right);

return;

}

4. a. O(C + S)

b. O(log(C) + S)

c. O(log(C) + log(S))

d. O(log(S))

e. O(1)

f. O(log(C) + S)

g. O(Slog(S))

h. O(C \* log(S))