Homework 5

1.

a. 50

20 60

10 40 70

15 30 65 80

25 38 72

b.

In-order: 10, 15, 20, 25, 30, 38, 40, 50, 60, 65, 70, 72, 80

Pre-order: 50, 20, 10, 15, 40, 30, 25, 38, 60, 70, 65, 80, 72

Post-order: 15, 10, 25, 38, 30, 40, 20, 65, 72, 80, 70, 60, 50

c. 50

25 60

10 40 70

15 38 65 80

72

2.

a.

struct Node {

int data;

Node\* parent, left, right;

};

b.

Starting from the root node

Repeatedly check with a current node:

check if node data is equal to current

return

check if node data is less than

if left child exists, set current node to it

otherwise,

insert new node at this position

new node has null child pointers and parent is current node

update current node left child pointer

return

check if node data is greater than

if right child exists, set current node to it

otherwise,

insert new node at this position

new node has null child pointers and parent is current node

update current node right child pointer

return

3.

a. 7

3 6

0 2 4

b. 7 3 6 0 2 4

c. 6 3 4 0 2

4.

a. O(C + S)

b. O(logC + S)

c. O(logC + logS)

d. O(logS)

e. O(1)

f. O(logC + S)

g. O(SlogS)

h. O(ClogS)