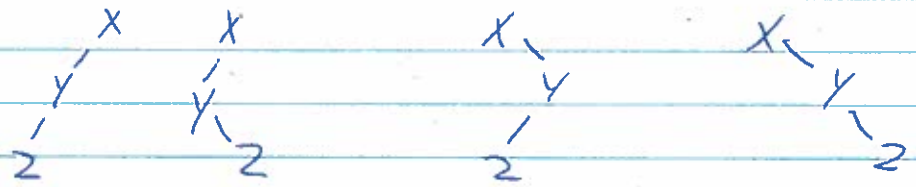
Andre

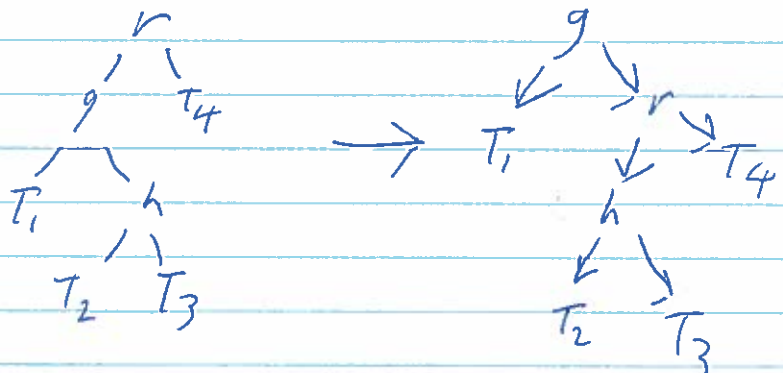
Completed without assistance or external resources

1. 0. $T_1 < T_2$
   1. $T_1 < c <= T_2 < b <= T_3$
   2. $T_1 < d <= T_2 < e <= T_3$
   3. $T_1 < g <= T_2 < h <= T_3 < r <= T_4$

4. 

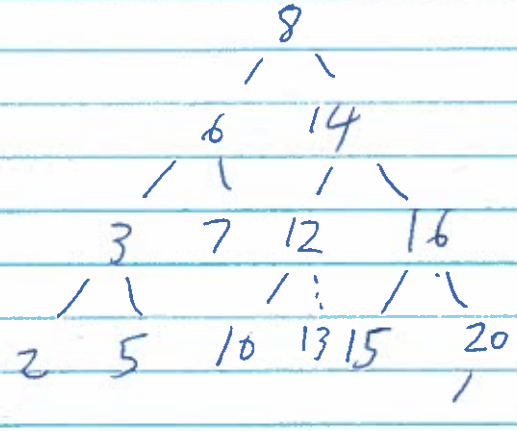
~~Z < Y < X~~, $Y <= Z < X$, $X <= Z < Y$, $X <= Y <= Z$

5. The property does not hold true for the tree from problem 3, as there are subtrees (T_2 & T_4) that begin 2 levels apart, so the tree is unbalanced. There are no other three-internal-trees given, so none are balanced.

6. 

To rebalance the tree, I selected the smallest ~~node~~ child of r to make the new root, and made r g's right-child, moved g's right child subtree to r's left subtree.

7.

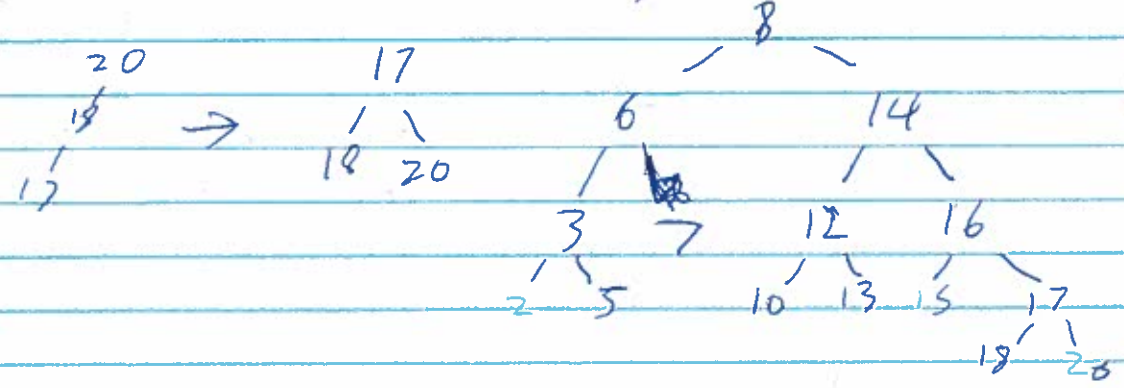


Node	Depth Difference
8	1
6	1
3	0
14	1
12	1
16	1
20	1

8. Right child of 12, yes

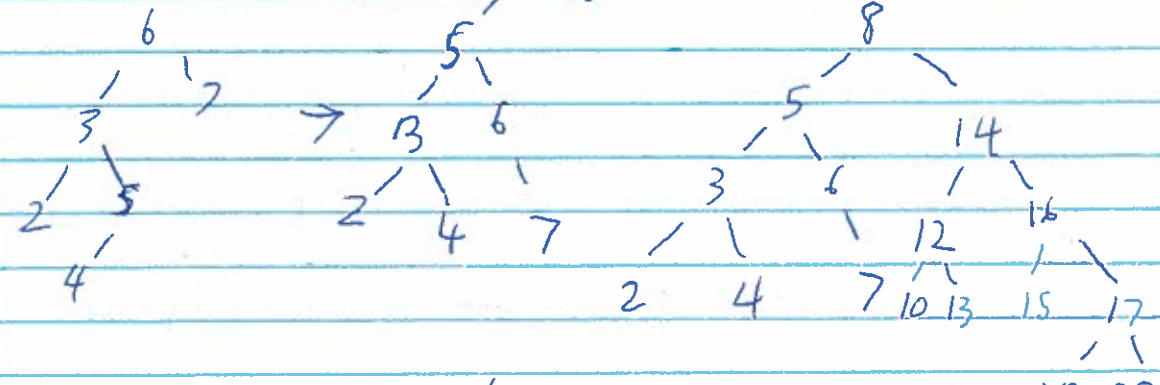
9. Left node of 18, no

11.



10. Left child of 5, no

11.



12. No because rebalancing a tree that was made unbalanced by a single insertion will only reduce the depth of the subtree, making