Quiz 3

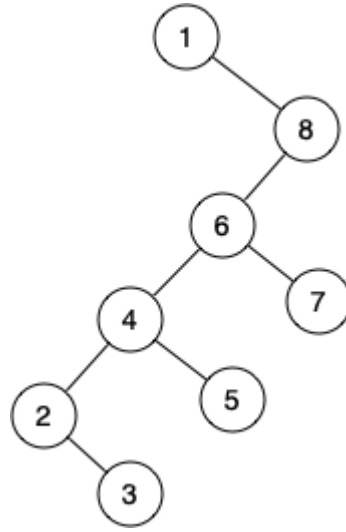| Deadline	Friday, 26 June 2020 at 11:59PM
Latest Submission	Friday, 26 June 2020 at 11:45AM
Raw Mark	4.00/4.00 (100.00%)
Late Penalty	N/A
Final Mark	4.00/4.00 (100.00%)

Question 1 (1 mark)

If the following values are inserted into an initially empty *splay tree* (using the algorithm from the slides)
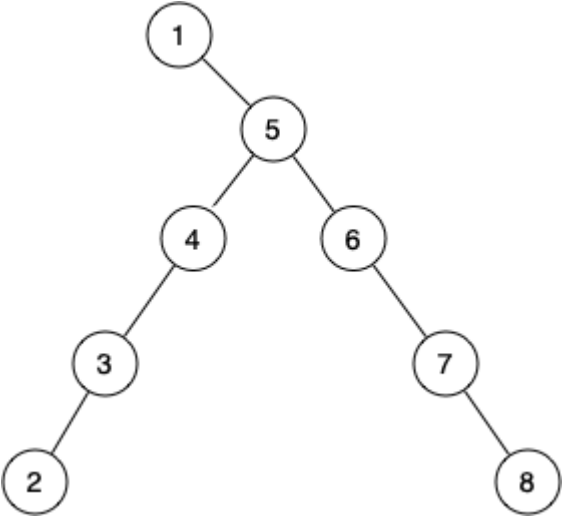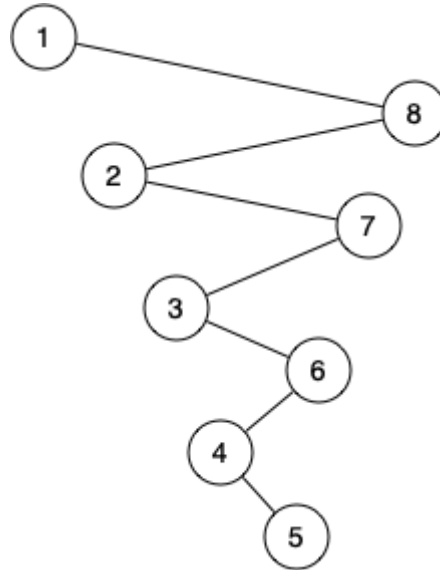
5 4 6 3 7 2 8 1

then what is the final tree structure?

(a)

```
        1
         \
          8
         /
        6
       / \
      4   7
     / \
    2   5
     \
      3
```

(b)

```
1
 \
  8
 /
2
 \
  7
 /
3
 \
  6
 /
4
 \
  5
```

(c)

(d)   None of the above

✔ Your response was correct.

Mark: 1.00

(b) is correct using the algorithm from the USFCA algorithm visualisation site.

None of the answers are correct if using the algorithm from notes.

We accept both (b) and (d) as "correct". Webcms3 can only show one "correct" answer, so people who chose (d) will still be told in Webcms3 that they got it wrong. The extra mark, however, will make its way to sturec.

Question 2 (1 mark)

What are the heights of the left and right subtrees in the following AVL tree?
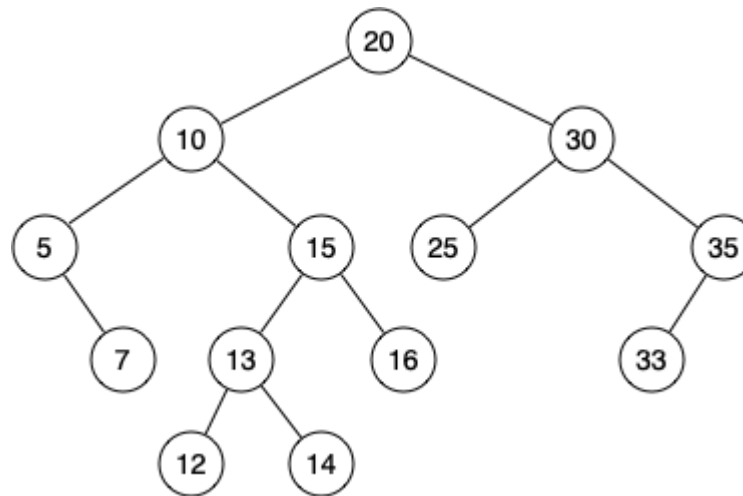
Height is measured in terms of the number of links in the longest path from the root of the subtree.

|		
(a) ⦿	height(L) = 3, height(R) = 2	
(b) ○	height(L) = 4, height(R) = 3	
(c) ○	height(L) = 8, height(R) = 4	
(d) ○	height(L) = 2, height(R) = 2	
(e) ○	None of the above	

✔ Your response was correct.

Mark: 1.00

Many people got this wrong. You are supposed to count the links starting from the *subtree root* , not the overall root.

In this case, the longest path from node 10 to a leaf has 3 links, and the longest path from node 30 to a leaf has 2 links.

Question 3 (1 mark)

Consider the following 2-3-4 tree:

	10	20	30		

| 3 | 6 | 7 | | 11 | 12 | 13 | | 25 | 26 | 29 | | 40 | 50 | 60 |
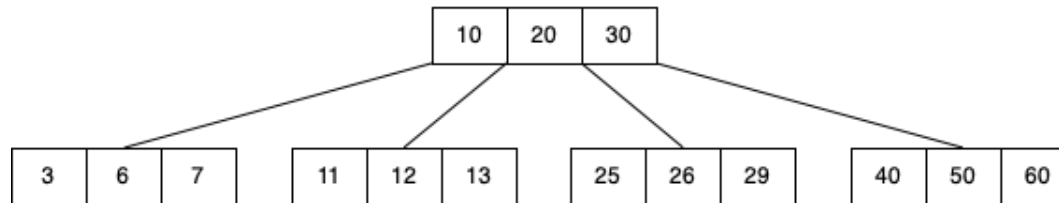
What value(s) will be in the new root node after insertion of the value 15?

(a)	10
(b)	15
(c)	20
(d)	30
(e)	10,20
(f)	15,20
(g)	20,30

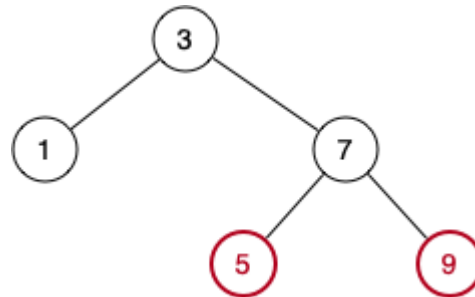| (h)	None of the above
○	

✔ Your response was correct.

Mark: 1.00

Question 4 (1 mark)

Consider the following red-black tree

How many rotations are performed when the value **6** is inserted into this tree

(a)	0
◉	
(b)	1
○	
(c)	2
○	
(d)	3
○	
(e)	More than 3
○	

✔ Your response was correct.
Mark: 1.00