Q3)

Iterative Algorithm

Number of Block	Cache Block Size (words)	Cache hit Rate (%)
1	256	42
2	128	100
4	64	100
8	32	100
16	16	100
32	8	99
64	4	99
128	2	98

Recursive Algorithm

Number of Block	Cache Block Size (words)	Cache hit Rate (%)
1	256	49
2	128	100
4	64	100
8	32	99
16	16	99
32	8	98
64	4	96
128	2	93

a) The hit rate is greater for the iterative algorithm of findRoot when the number of blocks is greater and the block size is smaller. This is because the stacks are being called less in the iterative function; while calls are also being made less since the recursion call isn't made in every loop. Also the iterative algorithm occupies less space in the cache than the recursive algorithm as a result calls are being made to the coprocessor less.

b) There are **6,578 iterative calls** vs. **13,265 recursive calls** being made. The iterative function calls less than recursion because the stack is being used less so less instructions are being made. Furthermore, the iterative algorithm also uses a while loop for a select amount of instructions, while the recursive algorithm uses goes through the whole function each time findRoot is called. As a result there are less than half the calls in the iterative algorithm as opposed to the recursive algorithm.