----- Question 1 ----- 6 marks for correct ordering of functions except for one error some functions written incorrectly 1 mark for minimal justification of ordering

----- Question 2 ----- 1 mark for correct order of growth for part c

----- Question 3 ----- 2 marks for correct base case reasoning 2 marks for correct induction hypothesis statement

----- Question 4 ----- 2 marks for correct base case reasoning 2 marks for correct induction hypothesis statement 2 marks for correctly using induction hypothesis 3 marks for correct algebra except for one error or omission

----- Question 5 ----- 1 mark for algorithm given in pseudocode 3 marks for algorithm with correct linear runtime without explaining why 2 marks for algorithm with correct use of logarithmic space without explaining why or incorrect explanation algorithm does not return the correct solution

----- Question 6 ----- 3 marks for algorithm that solves the problem 1 mark for algorithm given in pseudocode 1 mark for algorithm with worse than linearithmic runtime

----- PairProduct ----- 20 marks linear runtime

----- totals -----

7 out of 10 marks for Question 1

1 out of 10 marks for Question 2

4 out of 10 marks for Question 3

9 out of 10 marks for Question 4

6 out of 10 marks for Question 5

5 out of 10 marks for Question 6

20 out of 20 marks for PairProduct

-------------------------

52 out of 80 marks total