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Question: Fill in the last line of the three empty rows, which shows the size of a problem can be solved in the same amount of time for each complexity class on a new machine that runs nine as fast as the old one.

6. (3 pts) Fill in the last line of the three empty rows, which shows the size of a problem can be solved in the same amount of time for each complexity class on a new machine that runs nine as fast as the old one. Solve by hand when you can, use Excel or a calculator when you must: I used a calculator only for O(N Log₂ N) and solved it to 3 significant digits. Solving a problem in the same amount of time on the new/faster machine is equivalent to solving a problem that takes nine times the amount of time on the old machine. See O(N) for an example.

N = Problem Size	Complexity Class	Time to Solve on Old Machine (secs)	N Solvable in the same Time on a New Machine 9x as Fast
10 ⁶	O(Log ₂ N)	1	
10 ⁶	O(N)	1	9 × 10 ⁶
10 ⁶	O(N Log ₂ N)	1	
10 ⁶	O(N ²)	1	

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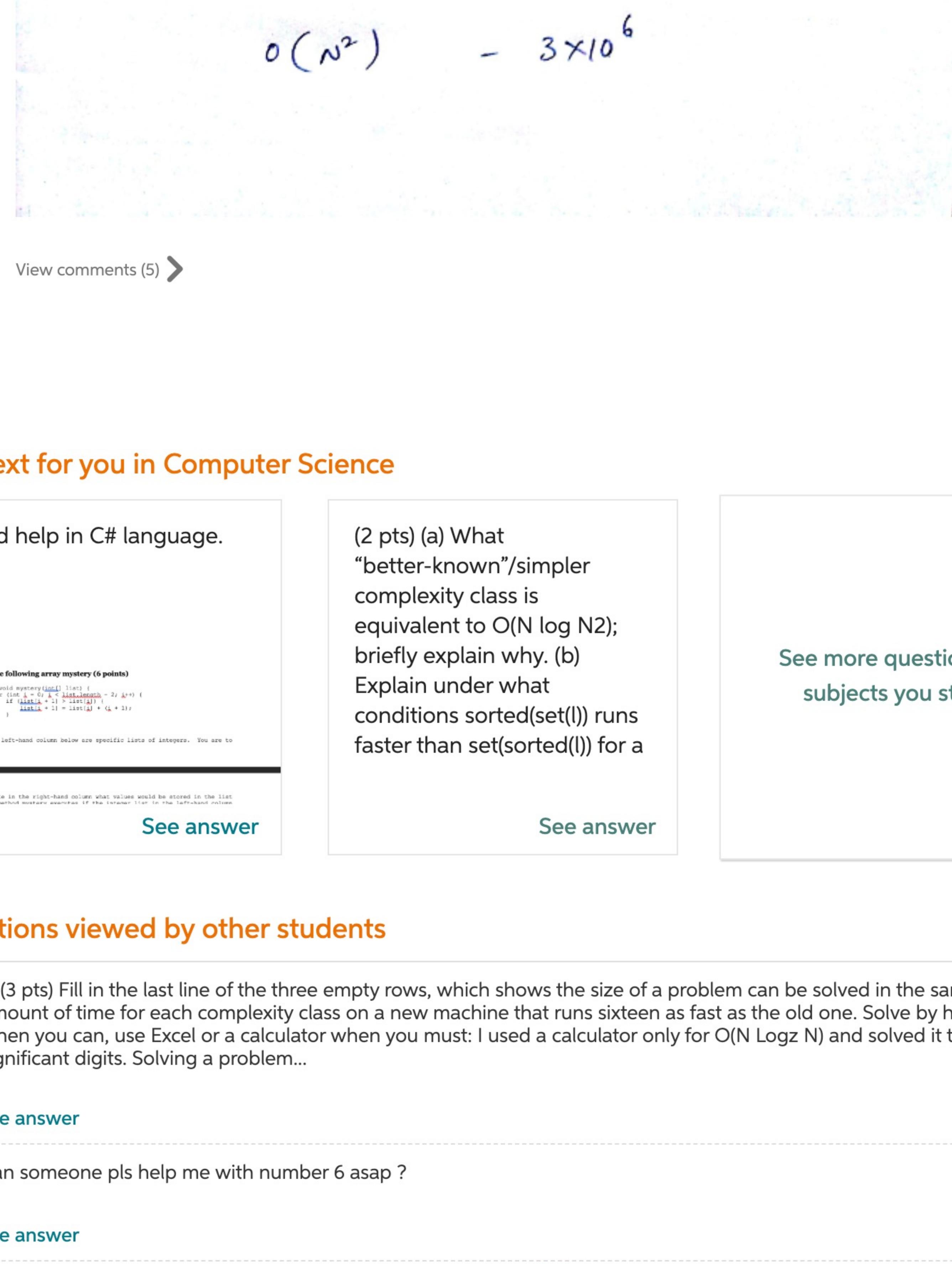
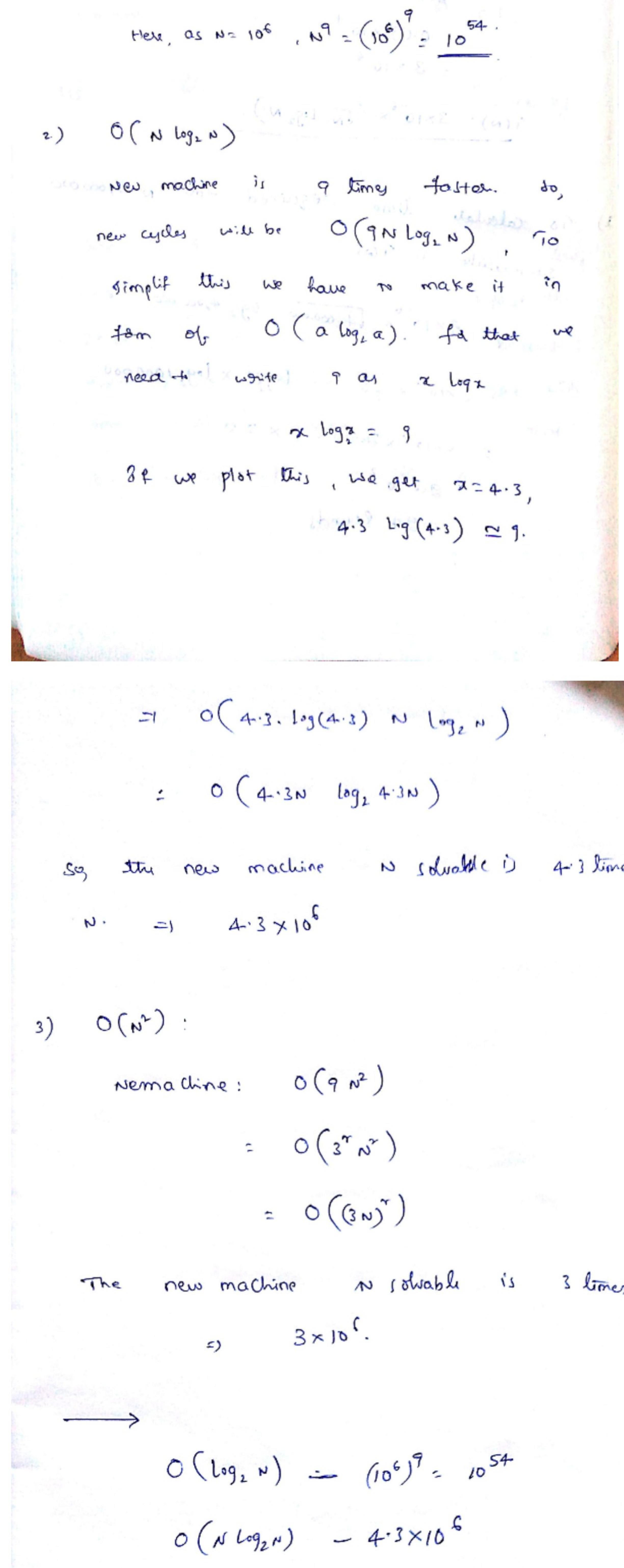
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