Information

These questions reiterate previous material about the analysis of algorithms.

Question 1

Answer saved

Marked out of 1.00

Compute, preferably in your head, $(\log_2(2^{1000} \cdot 8^{100}))$.

Answer: 1300

Question 2

Answer saved

Marked out of 1.00

Whenever a new, eagerly awaited volume of the epic multi-volume young adult fantasy saga *À La Recherche du Temps Perdu* hits the bookstores, young Marcel re-reads all the previous volumes in preparation. Alas, typically he falters in his resolve and only manages half of them. To be precise, when volume $(i+1)$ arrives, he re-reads volumes $1, \ldots, \lceil i/2 \rceil$.

How many books has he read (including re-reads) when the nth volume is published? (Among the big-Oh estimates, choose the smallest one.)

- [ ] a. $O(\log n)$
- [ ] b. $O(\sqrt{n})$
- [ ] c. $O(n)$
- [ ] d. $O(n \log n)$
- [x] e. $O(n^2)$

Clear my choice

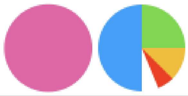
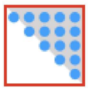
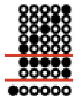
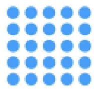
Question **3**

Answer saved

Marked out of 1.00

Pick, for each sum, the same expression in $\cdots$-notation, its closed form or approximation, and a useful way to remember that closed form.

(*Correction*: The sum on the top left should say $\sum_{i=0}^{n} \frac{1}{2^i}$, i.e., run from $i=0$ rather than $i=1$.)

$\sum_{i=1}^{n} \frac{1}{2^i}$	$1+2+4+8+\cdots+2^n$	~ 2	
$\sum_{i=1}^{n} 1$	$1+2+3+\cdots+n$	$= n$	
$\sum_{i=1}^{n} i$	$1+1+\cdots+1$	$\sim \frac{1}{2}n^2$	
$\sum_{i=0}^{n} 2^i$	$\frac{1}{1}+\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\cdots+\frac{1}{2^n}$	$= 2^{n+1}-1$	
$\sum_{i=1}^{n} n$	$n+n+\cdots+n$	$= n^2$	
$\sum_{i=1}^{n} \frac{1}{i}$	$\frac{1}{1}+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{5}+\cdots+\frac{1}{n}$	$\sim \ln n$