

NAME:

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Problem 1: For each pseudo-code below, tell what is the number of words printed if the input is n . Give a recurrence and then its solution (expressed using the Big-Theta notation.)

Pseudo-code	Recurrence and solution
<pre>procedure Hola(n) if $n > 1$ then for $j \leftarrow 1$ to n do print("hola") Hola($n/2$) Hola($n/2$) Hola($n/2$)</pre>	
<pre>procedure Ahoy(n) if $n > 1$ then for $j \leftarrow 1$ to n do print("ahoy") Ahoy($n/3$) Ahoy($n/3$)</pre>	
<pre>procedure Yo(n) if $n > 1$ then for $j \leftarrow 1$ to n do print("yo") Yo($n/2$) Yo($n/2$)</pre>	
<pre>procedure Cheers(n) if $n > 1$ then print("cheers") Cheers($n/2$)</pre>	

Problem 2: A group of 58 climbers set out to climb three peaks: Lhotse, Makalu, and Annapurna. Each of them managed to climb at least one peak. Among them:

- 40 people climbed Annapurna
- 25 people people climbed Makalu
- 29 people climbed Lhotse
- 15 people climbed Lhotse and Annapurna
- 16 people climbed Lhotse and Makalu
- 18 people climbed Makalu and Annapurna

How many people climbed all three peaks? Show your work. (And, by the way, where are those mountains?)

Problem 3: Find a particular solution of the recurrence $V_n = 3V_{n-1} - 4V_{n-2} + 3 \cdot 4^n$.