N = ong

## Homework 1

32) a. Construct a truth table for  $p \rightarrow \bar{p}$ 



b. Truth table for p => p

8	5	P
6	7,	( 0 '
1	0	0

d. Truth table (prg) - (prg)

Truth	4 de	le (pr	pra	(png) → (pvg)
	1 6	6	l	1
O	1	6	1	1
Ò	6	0	6	

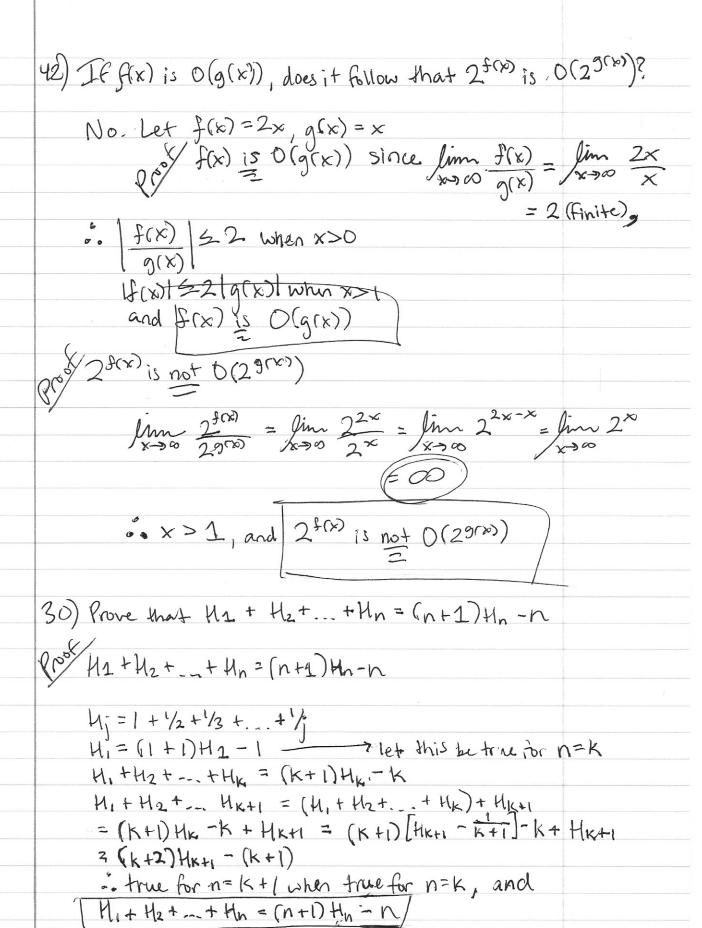
74) C. Prove or disprove this statement about the floor to ceiling Runction: [[X/2]/2] = [X/4] for all real x.

$$\frac{h-1}{2} \angle \frac{x}{2} \angle \frac{h}{2}$$

$$\frac{|X|}{|X|} = \frac{n}{2}, \frac{|X|}{|X|} = \frac{n}{4}$$

$$\frac{1}{2} = \frac{n}{4}$$

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	3) Given V11 V21 Vn of yes/no votes, describe an algorithm to determine the majority vote.  Find wibig-theta expression for the speed of the algorithm.
	of the majority vote.
	to determine the speed of the algorithm.
	Find Wbig-theta expression
	A C = vole and = D
	Assume each vote $V_n$ is = 1 for a yes vote and = 0 For a no vote. If $\sum_{i=1}^{n} V_n = \frac{n}{2}$ , then the majority vote is NO.
	Grano vote.
	TO My = n/2, then the majority vote is NO.
	It Z vn /= / / / / / / / / / / / / / / / / / /
	If I Vn = 1/2, then the majority vote is YES.
	If 21 Vn = 12, 41001 1100 1111111111
	121
	$V_n \longrightarrow \Phi(n)$
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2	



6) If Bob has the number 1, and the clock chims once, he will leave because he knows he has the smarkest pos. integer, so Carol must have # 2. If Bob has the number 2, much then he knows that Carol must have either 1 or 3. If carol leaves on the first chime, he knows her humber is I. If she does not, he knows his number (2) must be smaller than hos, so hers mut be 3 , and he leaves the room. > This logic is true for all n > 1, including n=k and n=k+1 oo, a person w/ smaller humber (n) will leave the room on the now chime