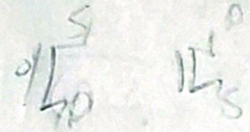
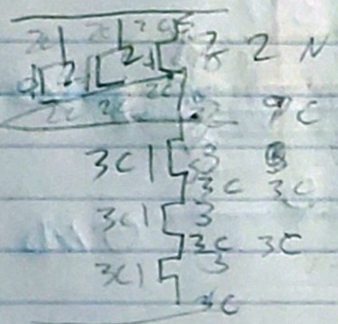
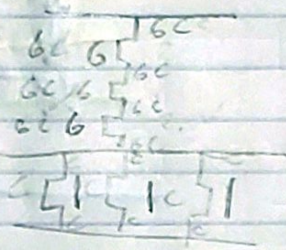


2) Which has worse parasitic capacitance N in Nand or N in NOR?
Evaluate 2 delays and compare. Assume diffusion sharing

N input Nand

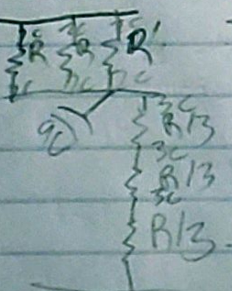


N input Nor



Diffusion sharing happens when S+d touches

3 in Nand



Average prop $= \frac{t_{rise} + t_{fall}}{2}$

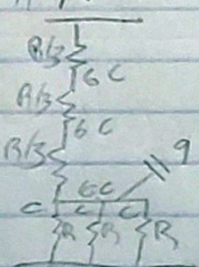
$T_{rise} = 9CR$

$T_{fall} = 3CR + 3C\frac{2R}{3} + 3CR$

$T_{pd} = \frac{(9+6)RC}{2} = \frac{15RC}{2}$ Nand

$= RC + 2RC + 3RC = 6RC$

3 in Nor



N=3

$T_{rise} = \frac{R}{3}6C + \frac{2R}{3}6C + R\,6C$

$= 2RC + 4RC + 6RC$

$= 12RC$

$T_{fall} = 9CR$

$T_{pd} = \frac{9CR + 12RC}{2} = \frac{21RC}{2}$ NOR

Worse N-input parasitic delay comes from NOR