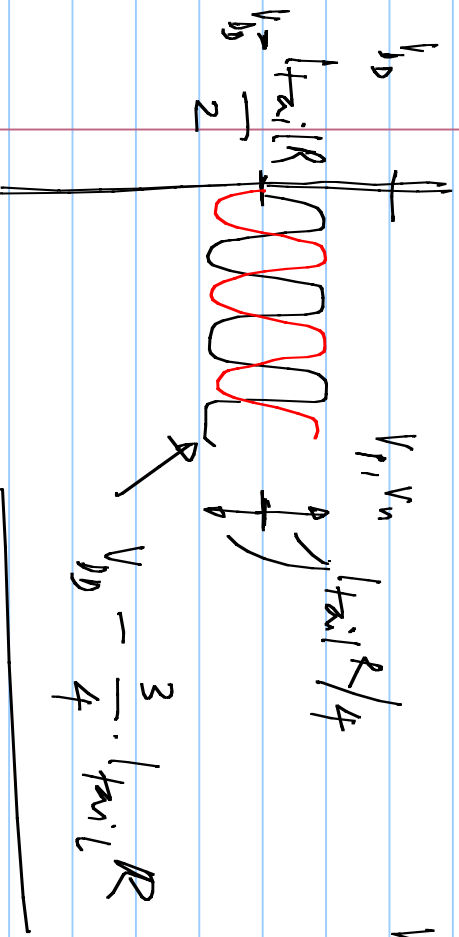
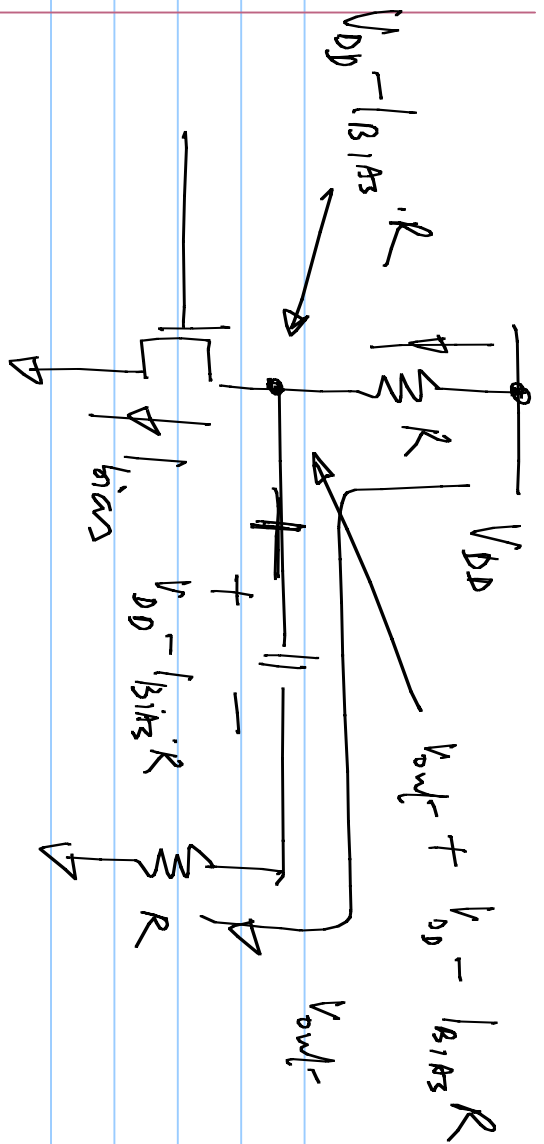


$$V_{cm} = V_{DD} - I_{tail}R/2$$



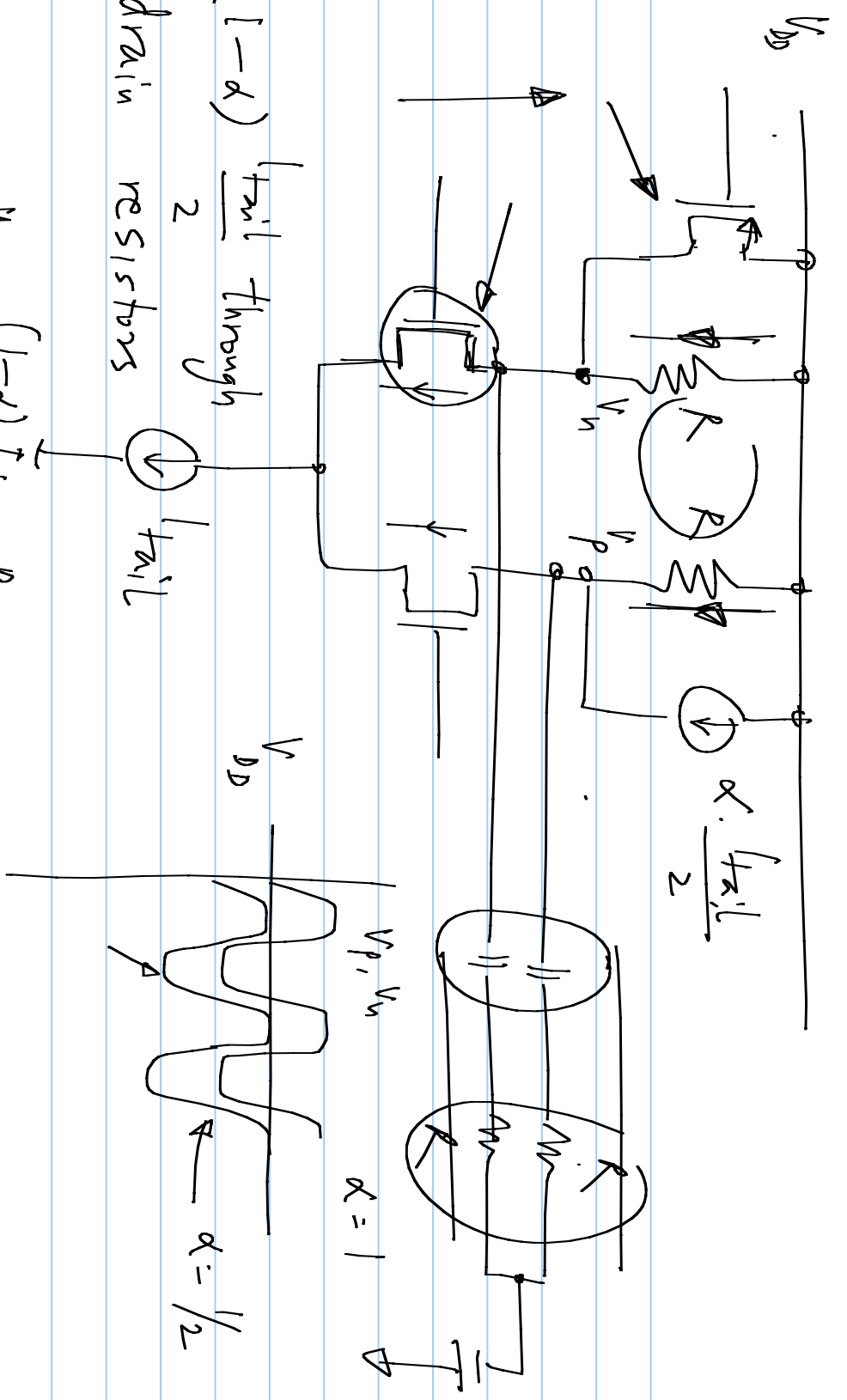
$$V_{DD} - \frac{3}{4} \cdot I_{tail}R$$



$$V_{DD} - (V_{out} + V_{DD} - I_{BIAS} R) = \frac{V_{out}}{R}$$

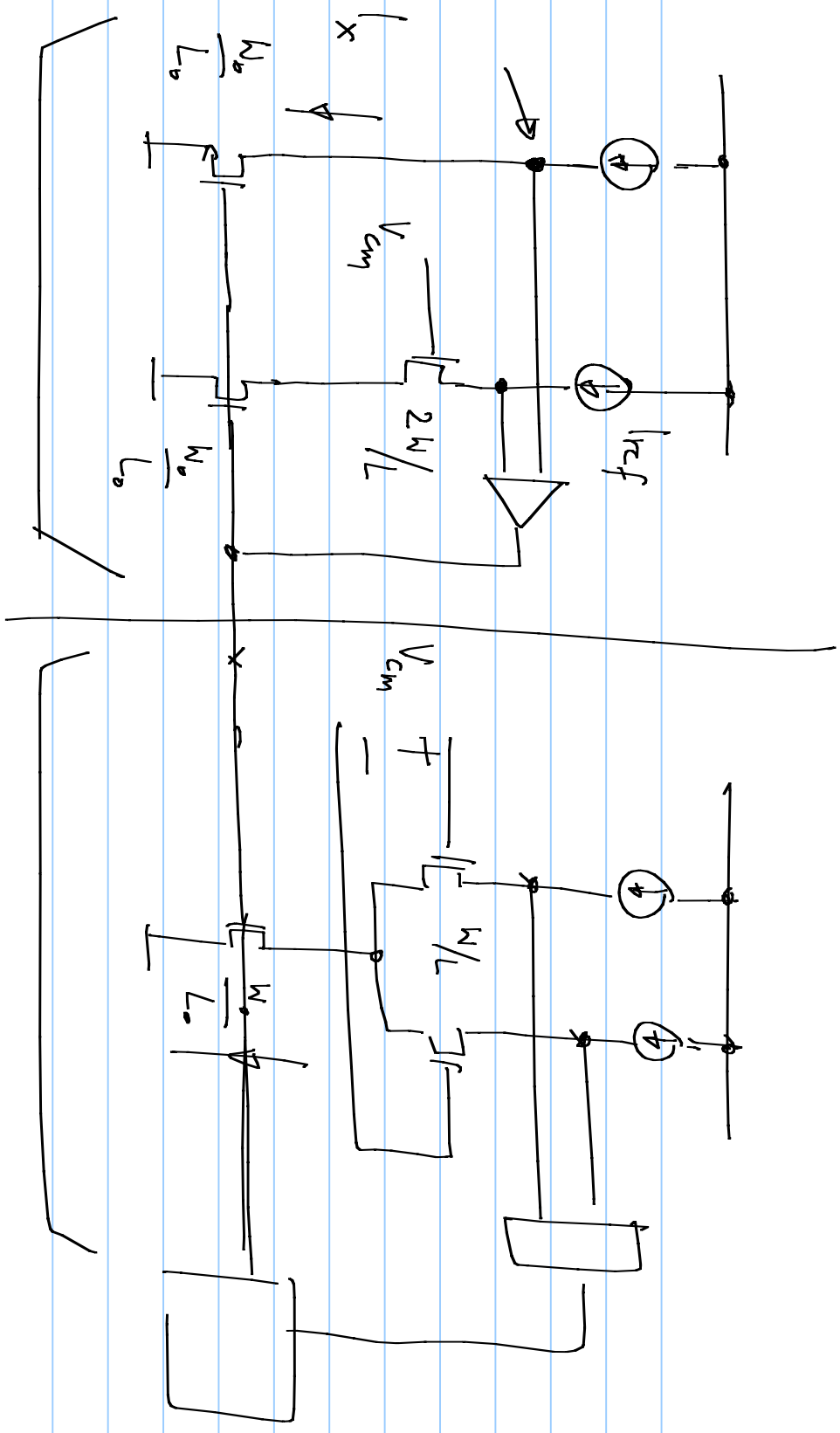
$$I_{BIAS} R - V_{out} = \frac{V_{out}}{R}$$

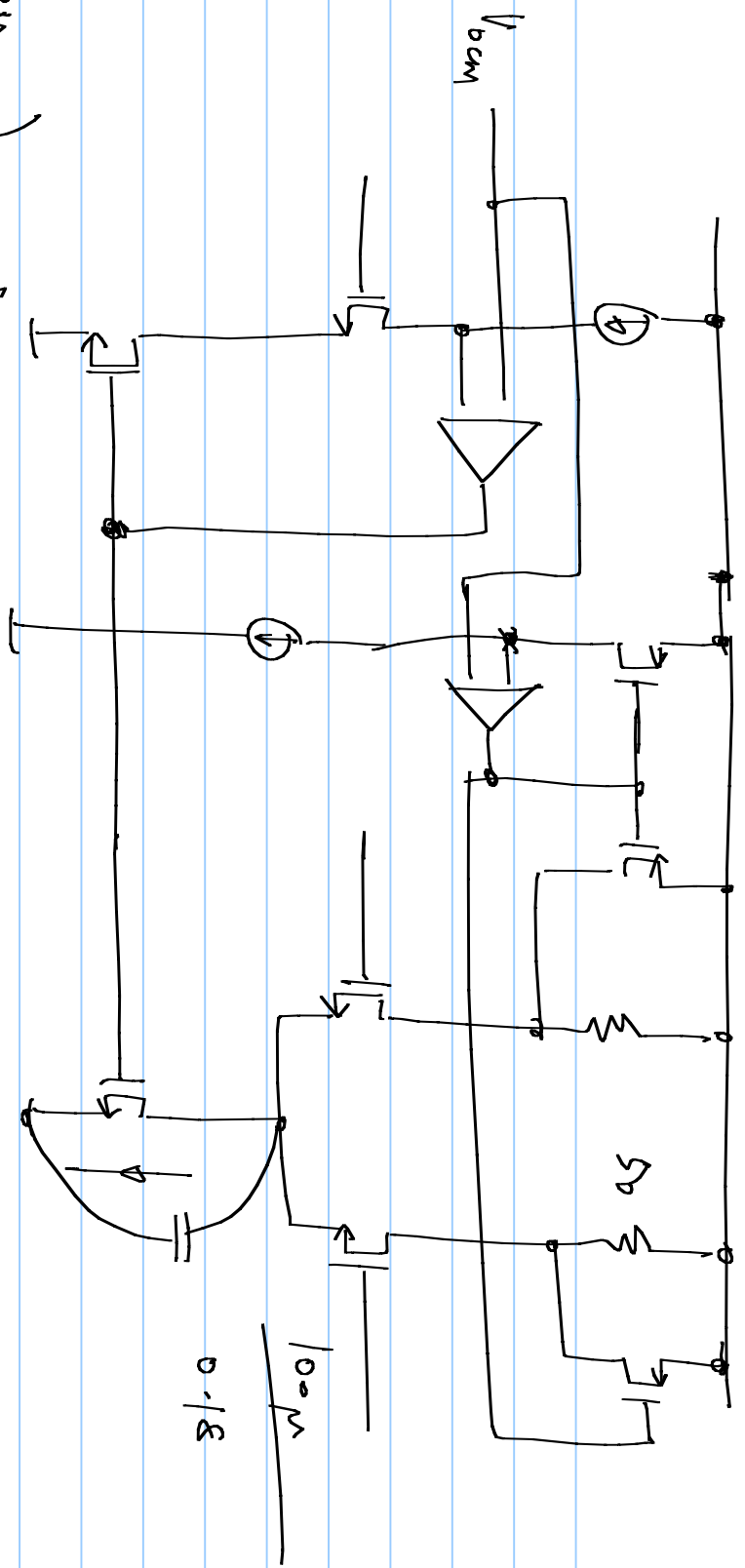
$$V_{out} = \frac{I_{BIAS} R}{2}$$



$(1-\alpha) \frac{I_{tail}}{2}$ through
drain resistors

$$V_{ocm} = V_{DD} - (1-\alpha) \frac{I_{tail}}{2} \cdot R$$





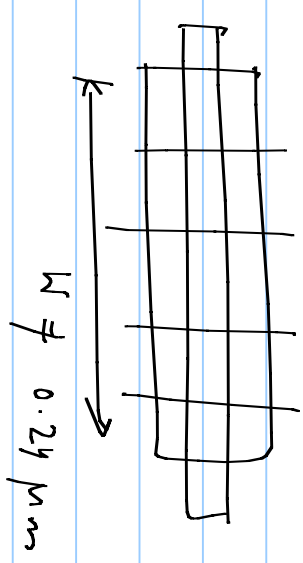
$100 \mu A$
 0.18

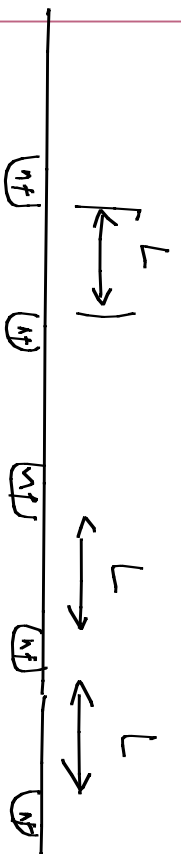
0.5V_{pk} across 25Ω

100 μA
 0.18

V_S
 $(50 \times \frac{25}{0.18})$
 \sqrt{WL}

20mA

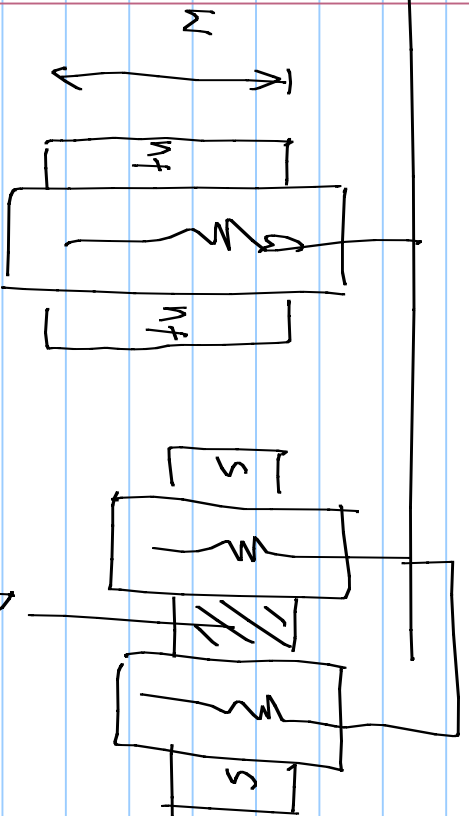




① Multiple fingers:

Reduced s/d parasitics

large # fingers $\sim 0.5x$



- ② Matching
- ③ Gate resistance

