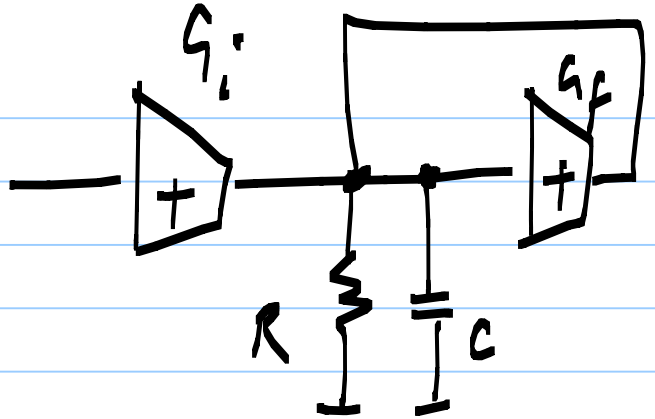
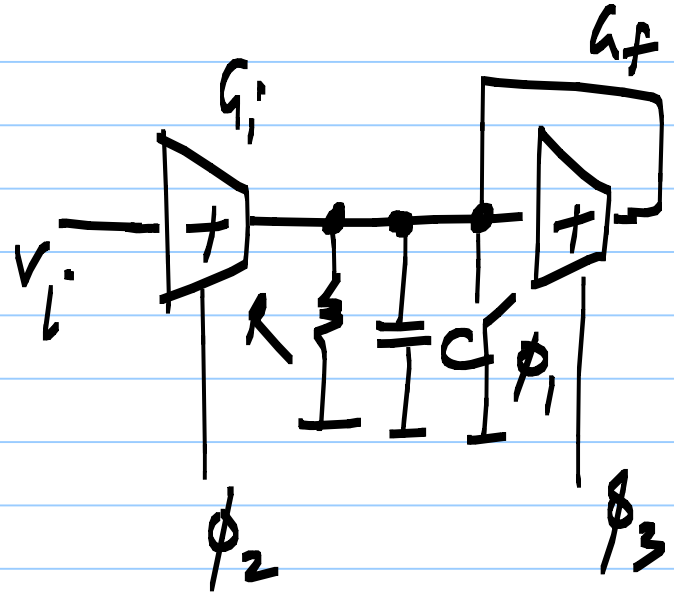
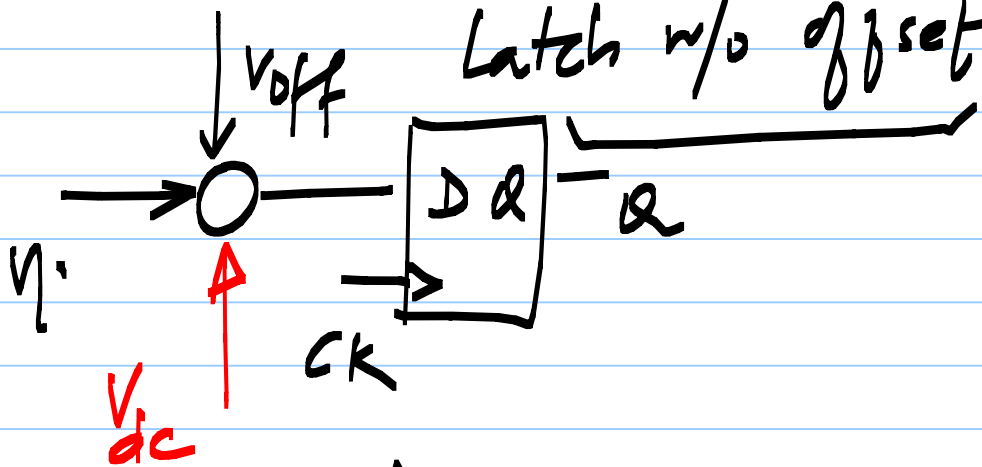


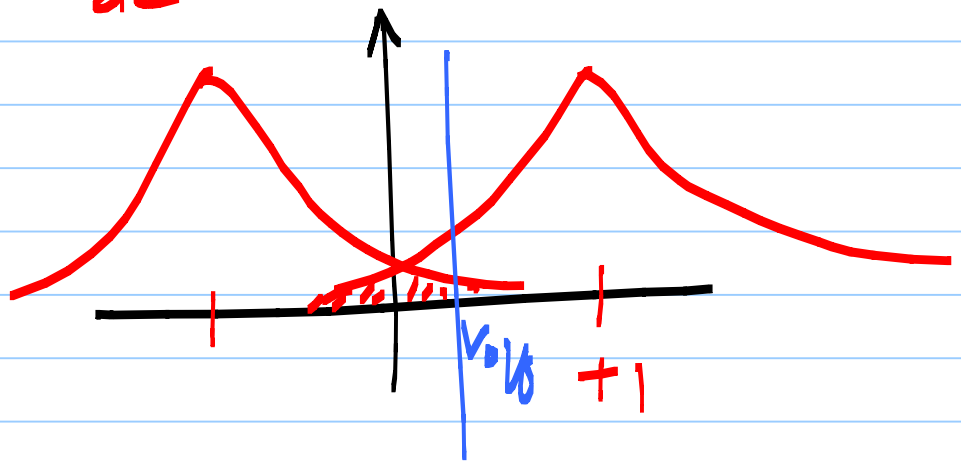
Comparator (no clock) with hysteresis.

Offset:

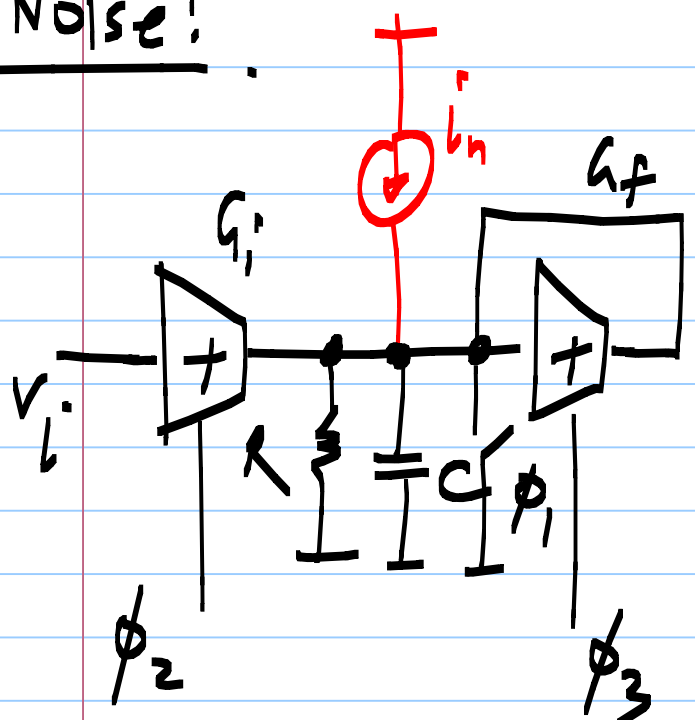


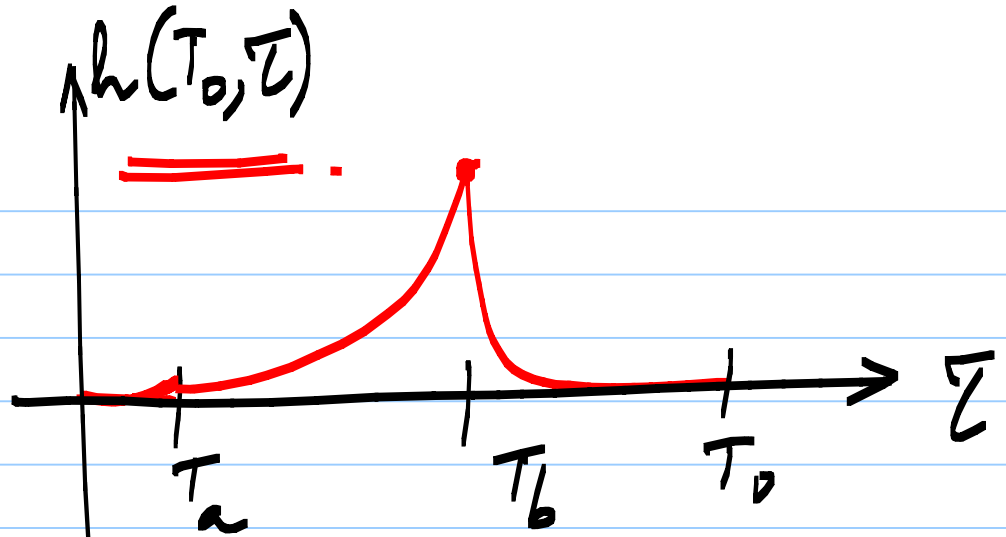
Mismatches in G_i, G_f



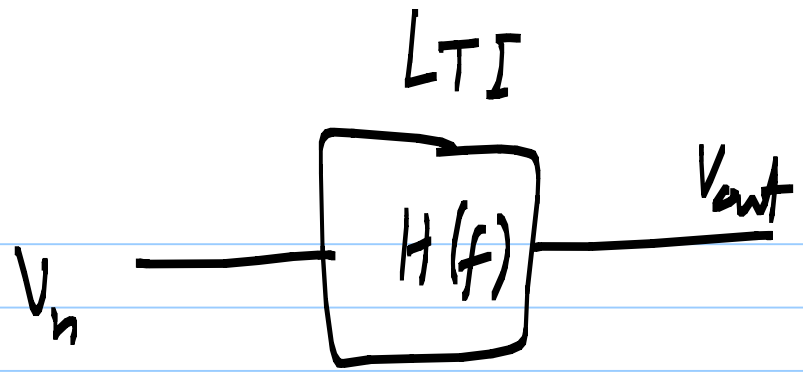


Noise:





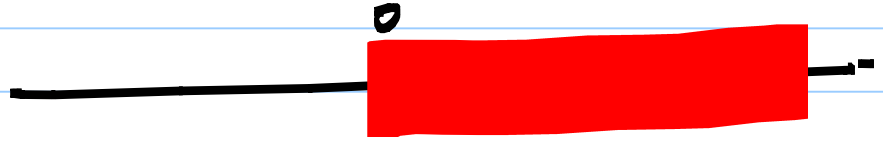
$$\overline{v_n^2}\Big|_{T_0} = \frac{N_0}{2}\int_0^{T_0} h^2(T_0,\tau)\,d\tau$$



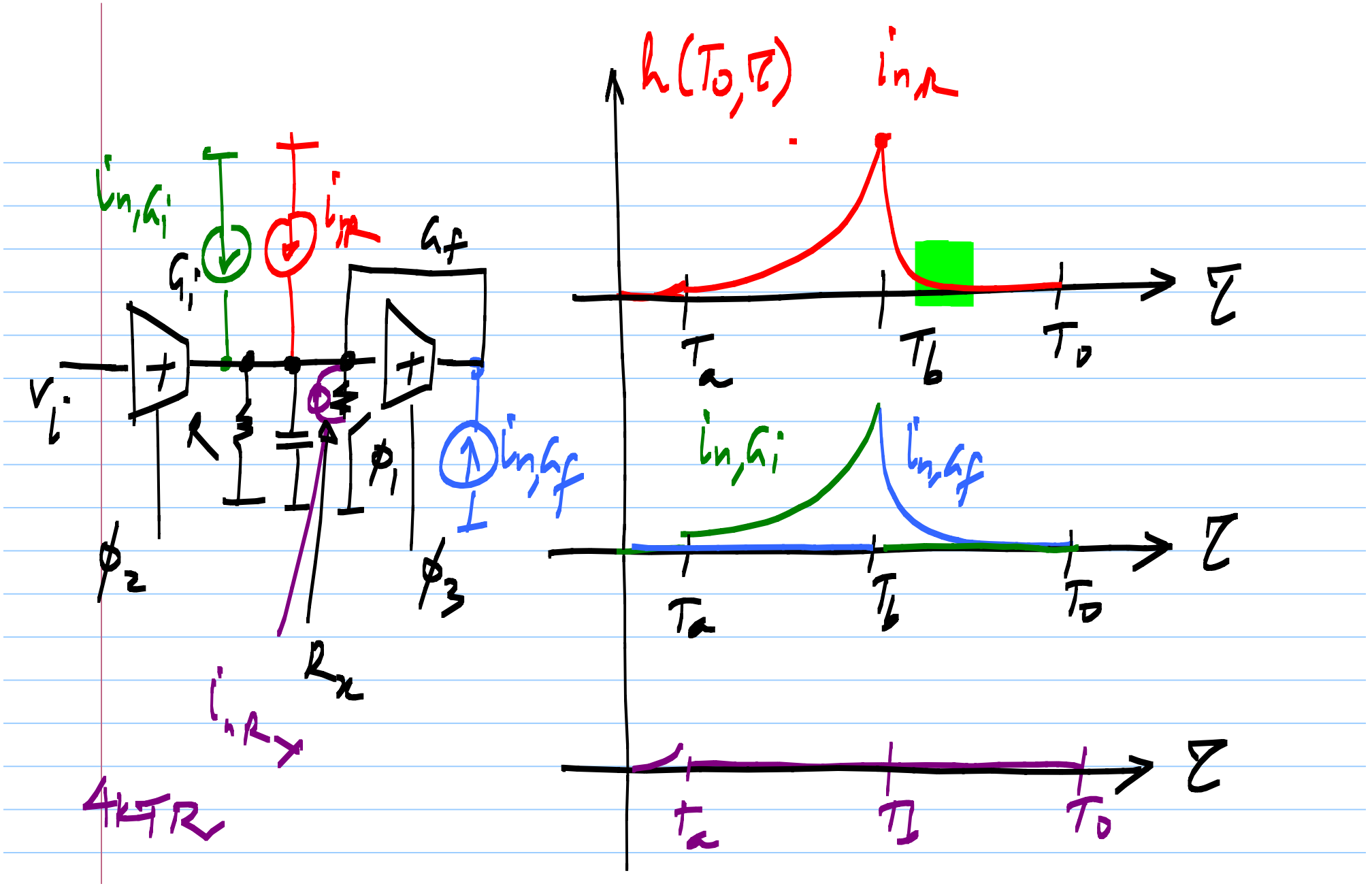
White: N_0

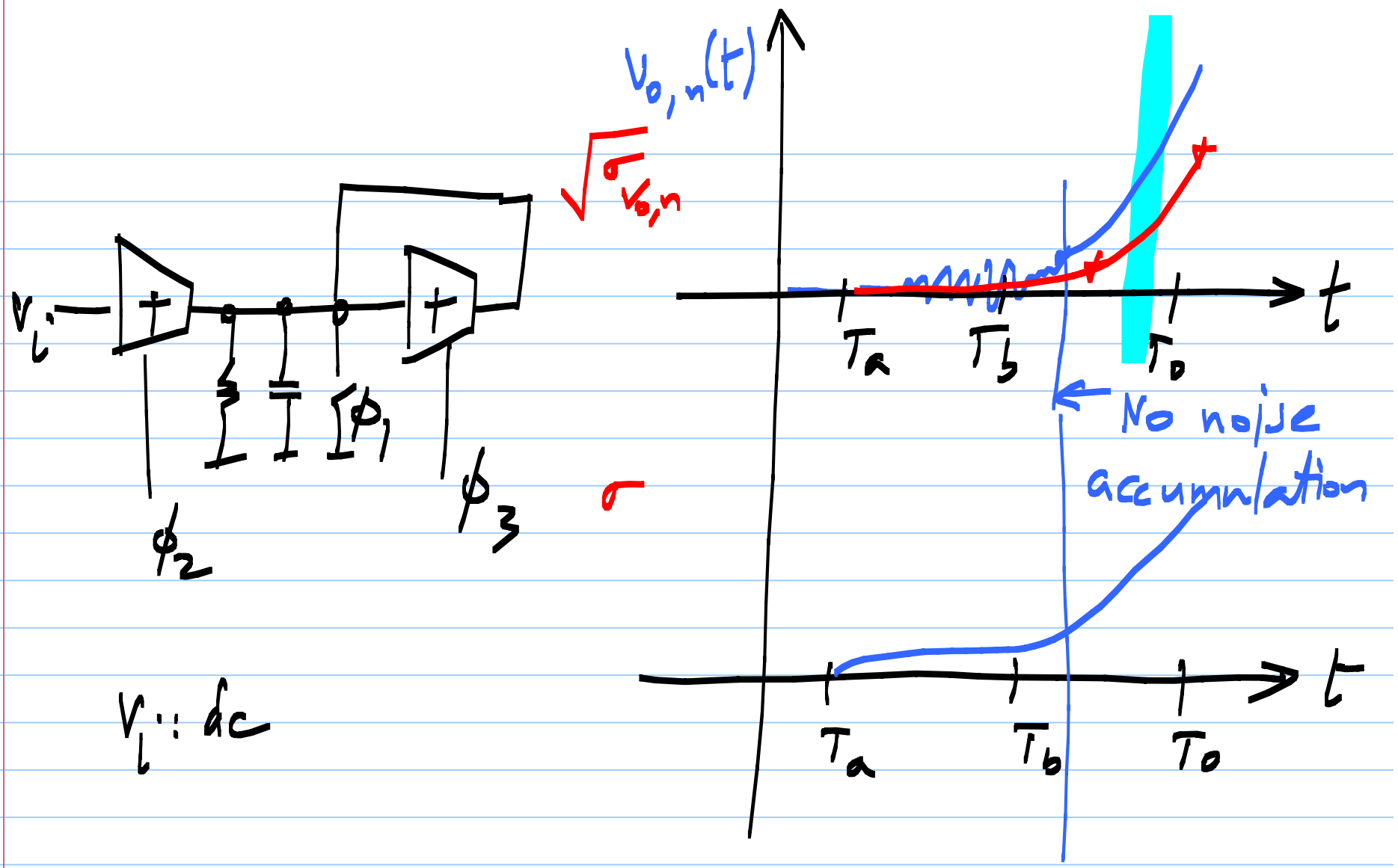
Single-sided spectral density

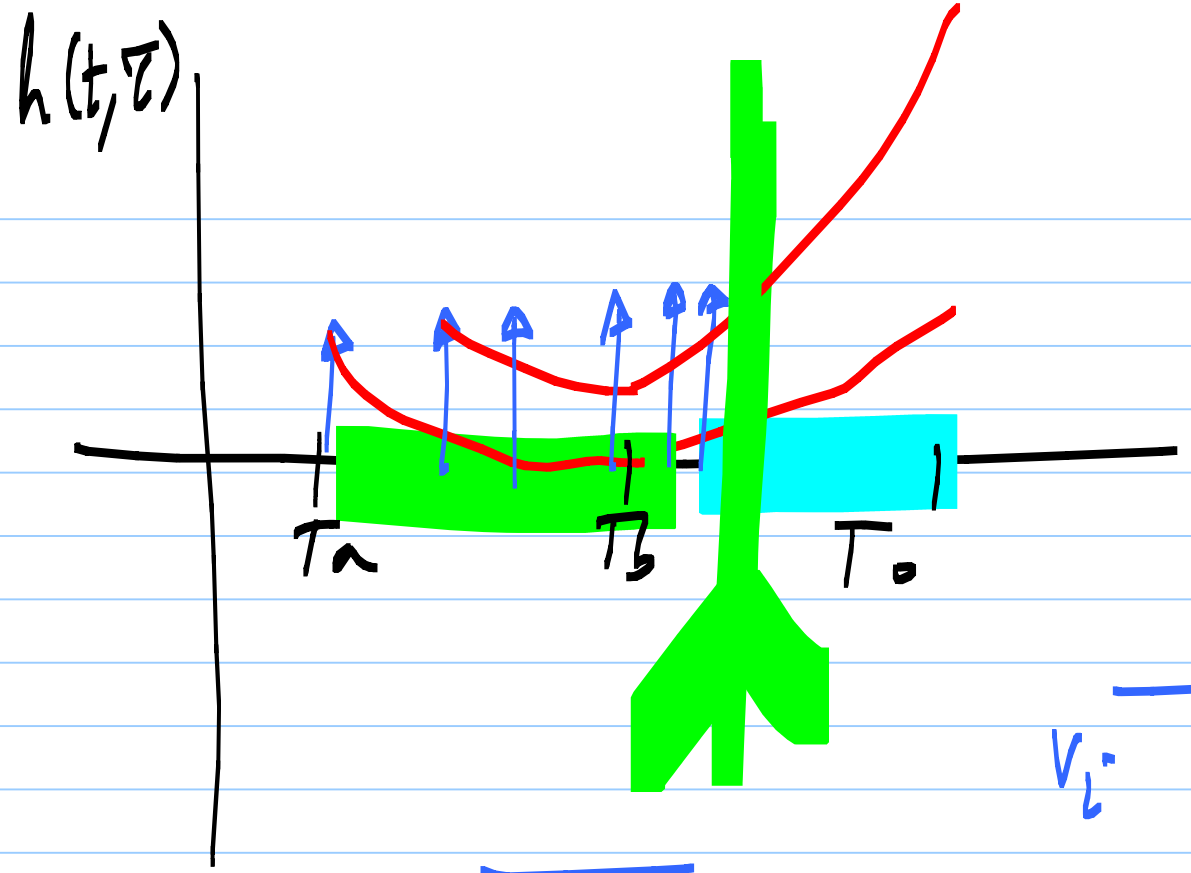
$$\sigma^2_{V_{out}} = N_0 \cdot \int_0^\infty |H(f)|^2 \, df$$



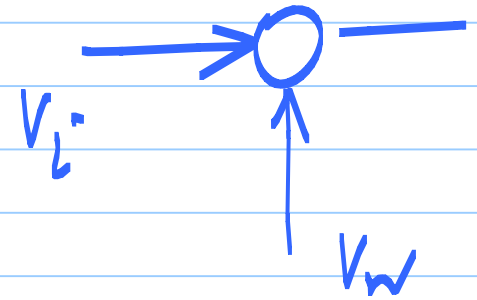
$$= \frac{N_0}{2} \int_{-\infty}^{\infty} h^2(t) \, dt$$

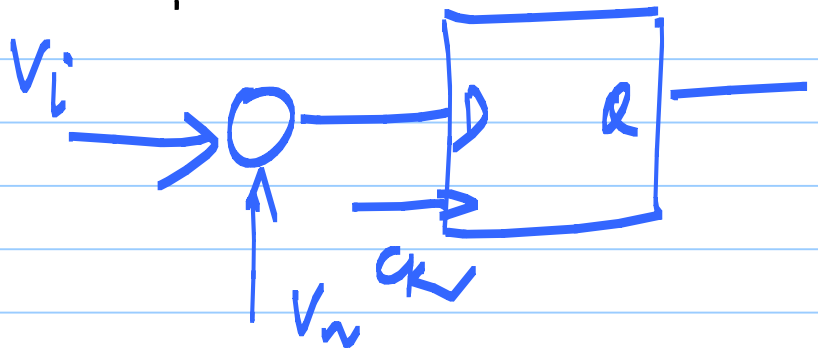

i_{n,G_i}
i_{n_R}
G_i
G_f
V_i
ϕ_1
ϕ_2
ϕ_3
i_{n,G_f}
R_x
$i_{n_{R_x}}$
$4kTR$
$h(T_0,\tau)$
i_{n_R}
τ
T_a
T_b
T_0
i_{n,G_i}
i_{n,G_f}
τ
T_a
T_b
T_0
τ
t_a
T_1
T_0


V_i
ϕ_1
ϕ_2
ϕ_3
V_i : dc
$V_{o,n}(t)$
$\sqrt{\sigma_{V_{o,n}}}$
σ
T_a
T_b
T_o
t
No noise accumulation
T_a
T_b
T_o
t

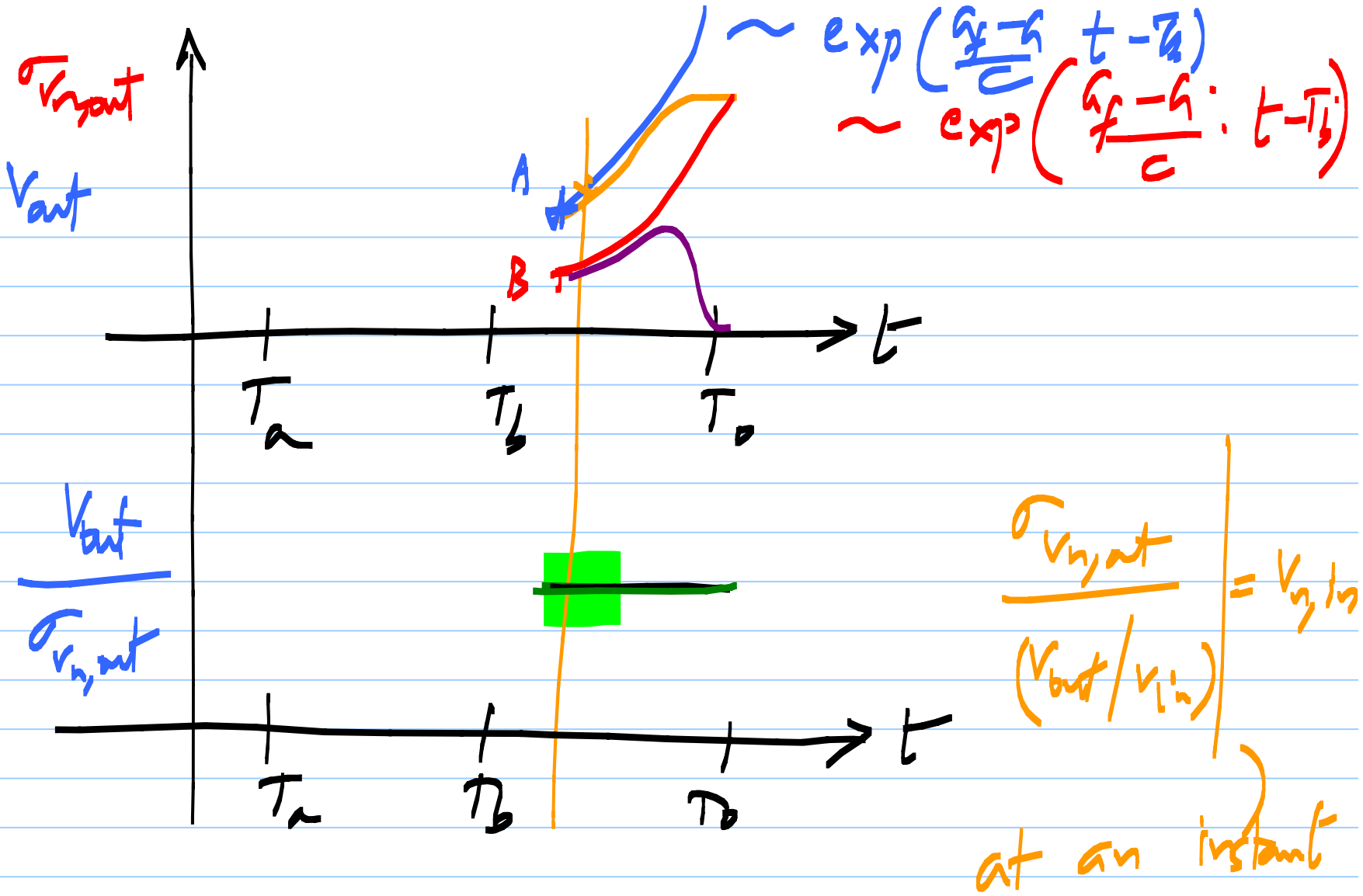


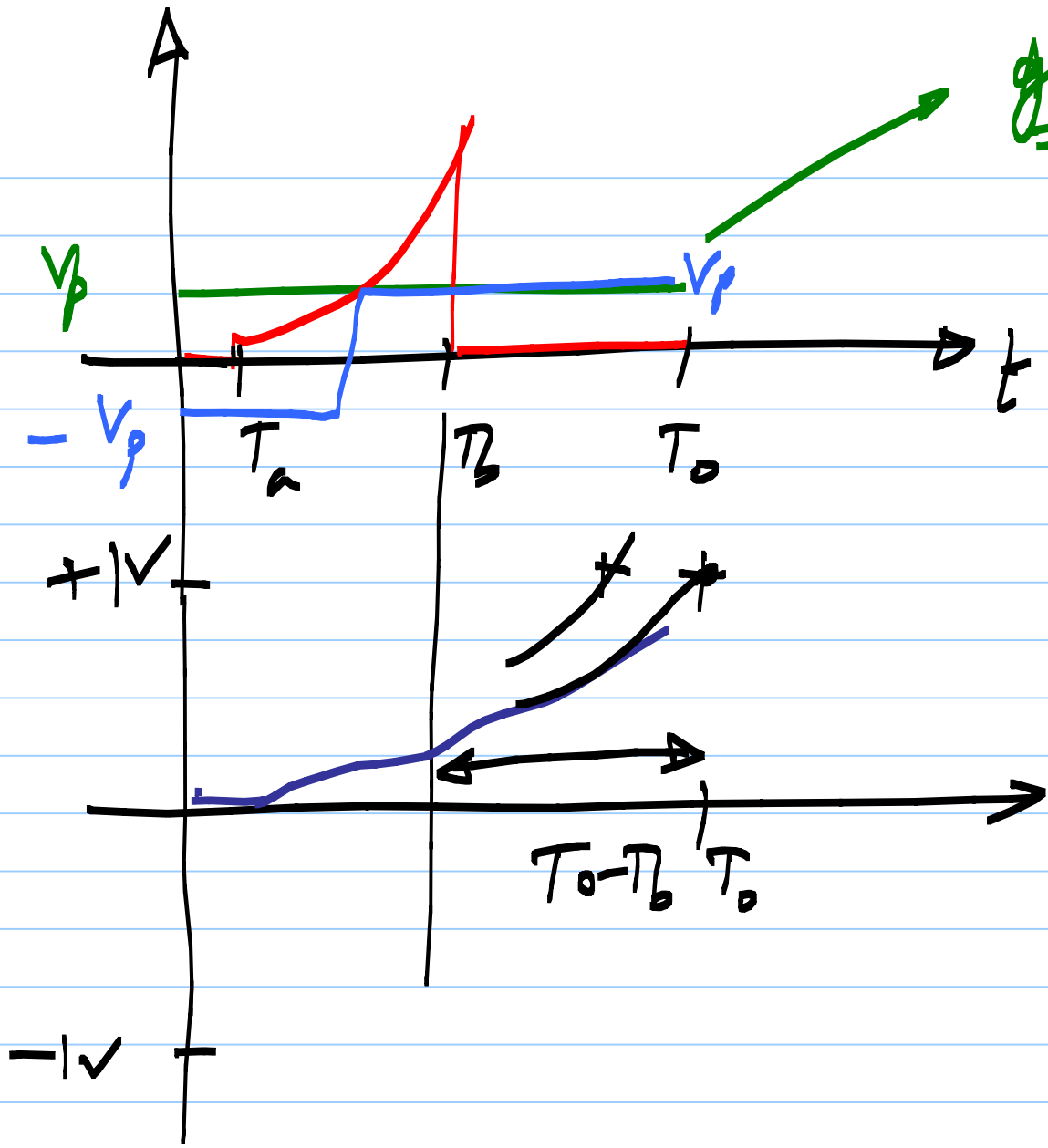
$$Q\left(\frac{V_{sig}}{\sigma}\right)$$





$$Q\left(\frac{V_t}{V_n}\right)$$

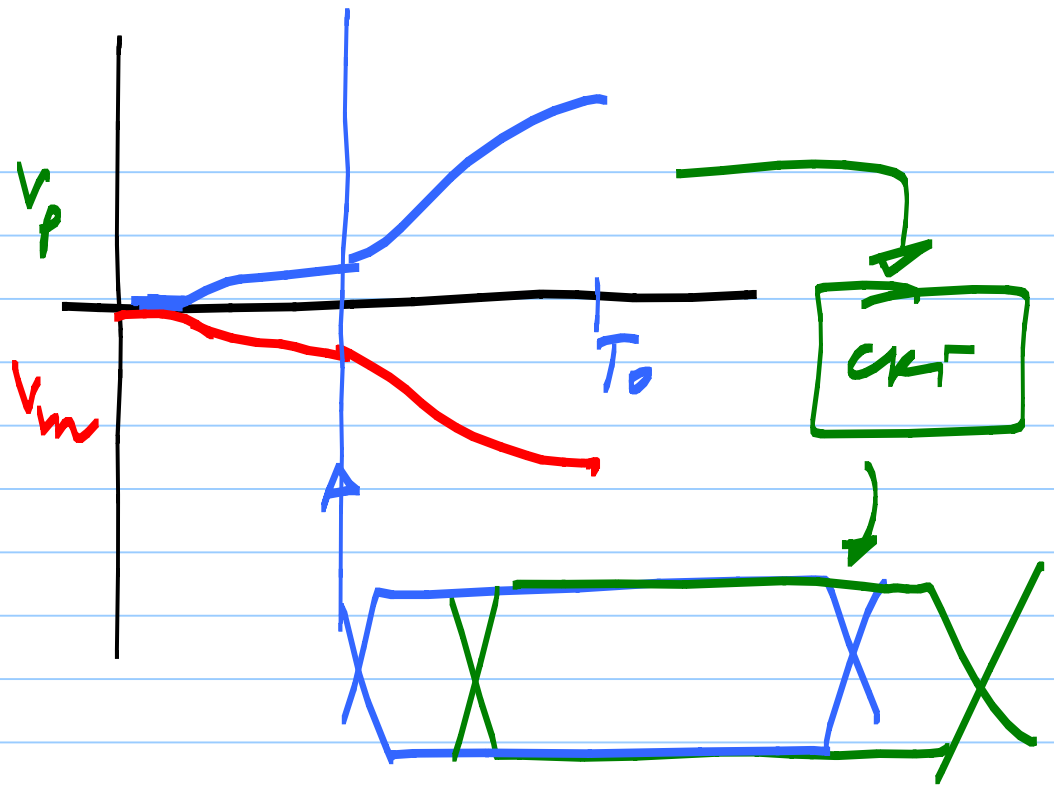

$\sigma_{v_n,out}$
V_{out}
A
B
T_a
T_b
T_c
t
$\frac{V_{out}}{\sigma_{v_n,out}}$
$\frac{\sigma_{v_n,out}}{(V_{out}/V_{in})} = V_{n,in}$
at an instant



gain

Sensitivity t_{sn}

t_{ca} vs. V_p


V_p
V_m
T_0
CKT