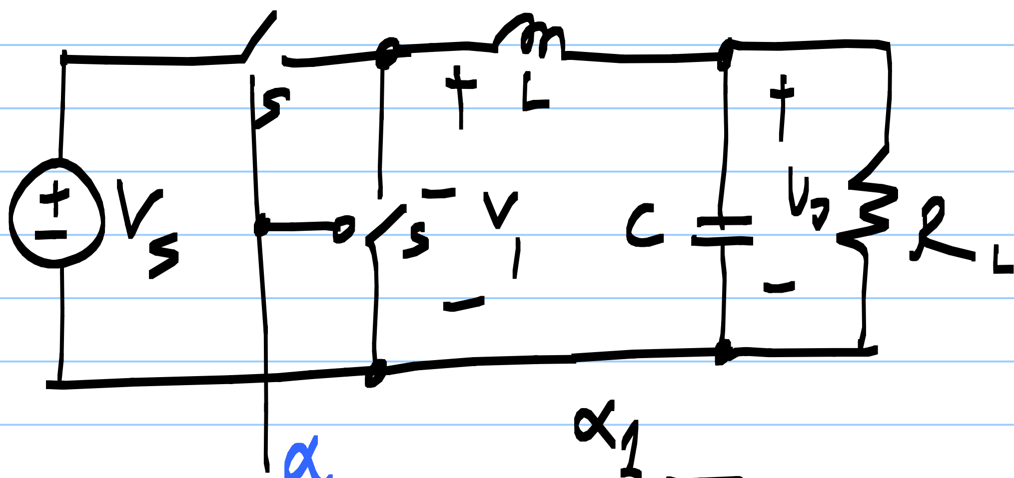
EE2019 — DC-DC converters — 14/3/2018

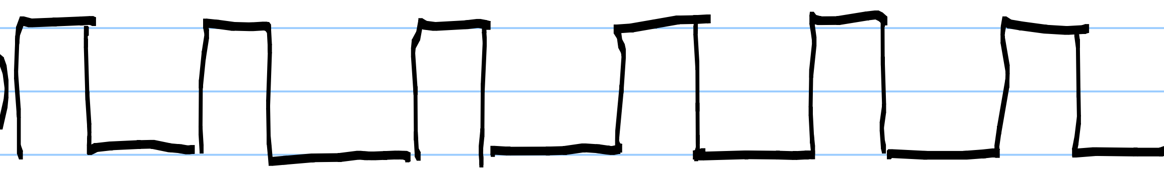


$$\frac{v_o}{v_1} = \frac{1}{s^2LC + \frac{sL}{R} + 1}$$

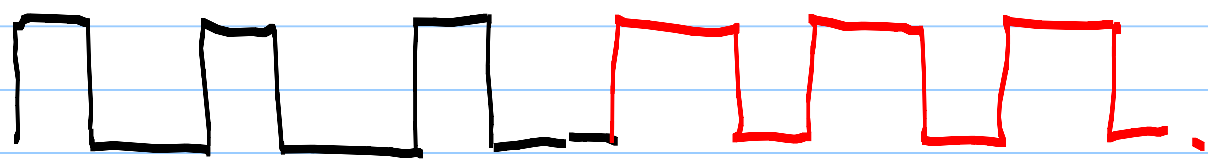
$\to h(t)$

α_1

$\hat{v}_1 * h(t) \leftarrow \hat{v}_1(t)$

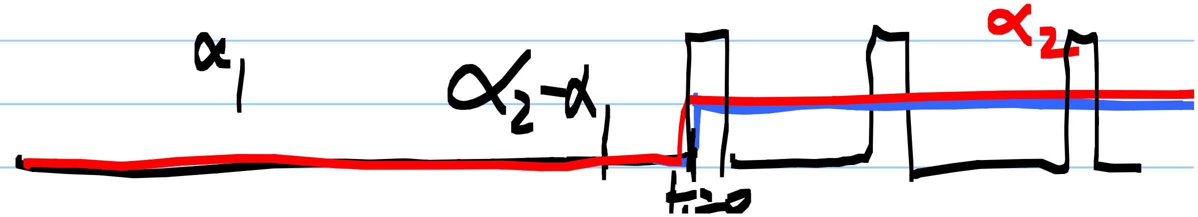


$v_1 * h(t)$ $v_1(t)$



Change:

$(v_1 - \hat{v}_1) * h(t)$



$$y * h\Big|_t = \int_0^t v_1(\tau) \cdot h(t-\tau) \cdot d\tau$$

$$(v_1 - \hat{v}_1) * h\Big|_t = \int_0^t \left[v_1(\tau) - \hat{v}_1(\tau)\right] h(t-\tau)\, d\tau$$

$$= \int_0^{T_0} \left[v_1(\tau) - \hat{v}_1(\tau)\right] h(t-\tau)\, d\tau$$

$$+ (\ ) \int_{T_0}^{2T_0} \left[v_1(\tau) - \hat{v}_1(\tau)\right] h(t-\tau)\, d\tau$$

$$+ \ldots$$

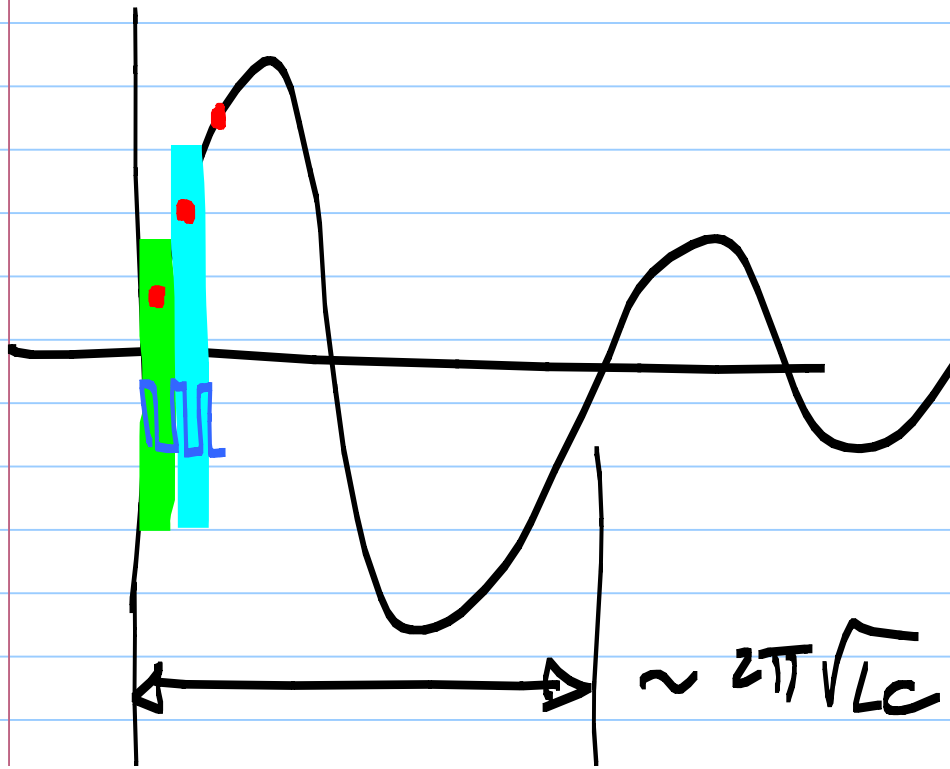
$$H(s) = \frac{1}{s^2 LC + s\frac{L}{R} + 1} = \frac{1/LC}{s^2 + \frac{s}{CR} + \frac{1}{LC}}$$

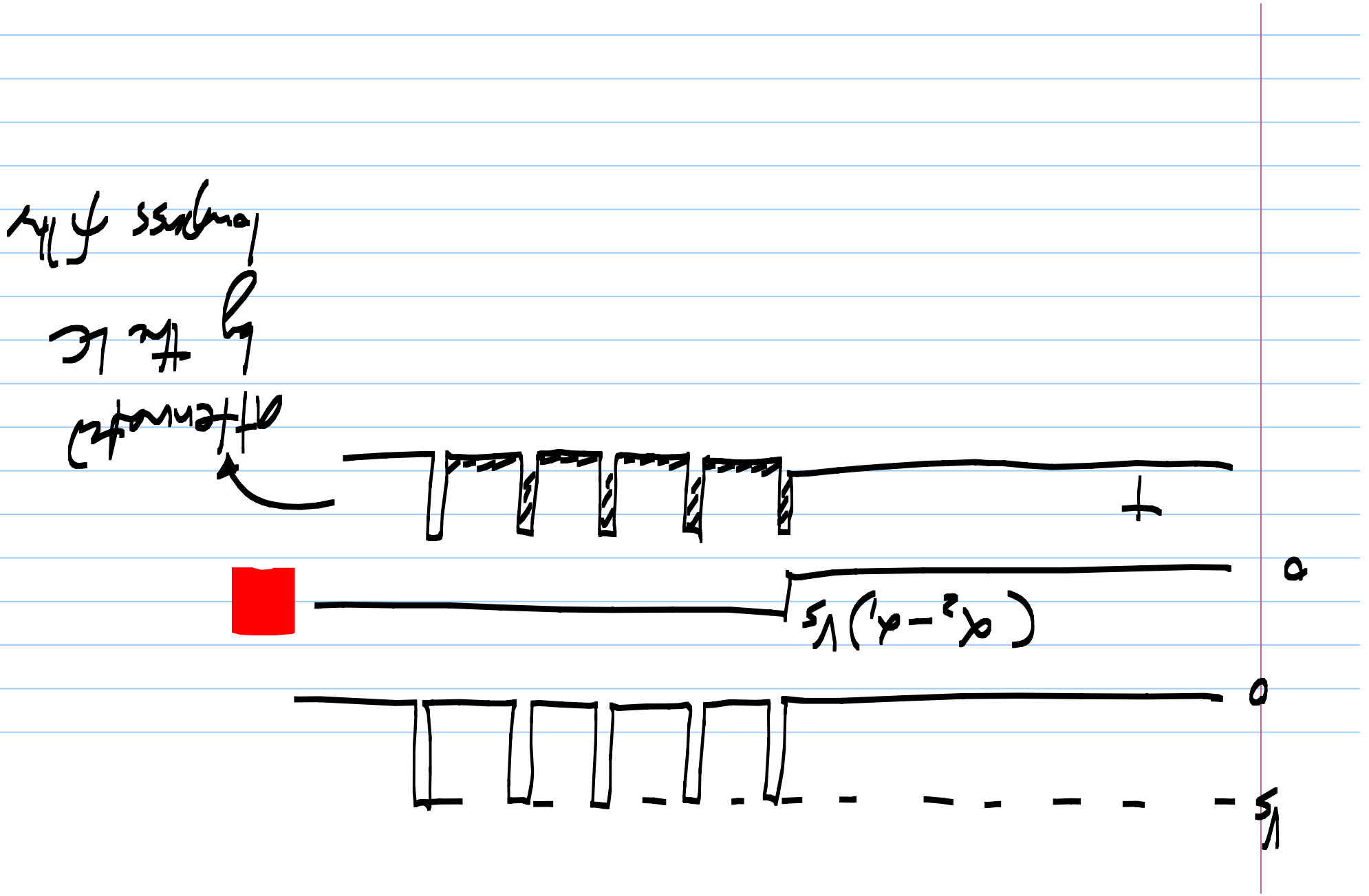
$$h(t) = (\ ) \cdot \exp(-\sigma t)\sin(\omega t)$$

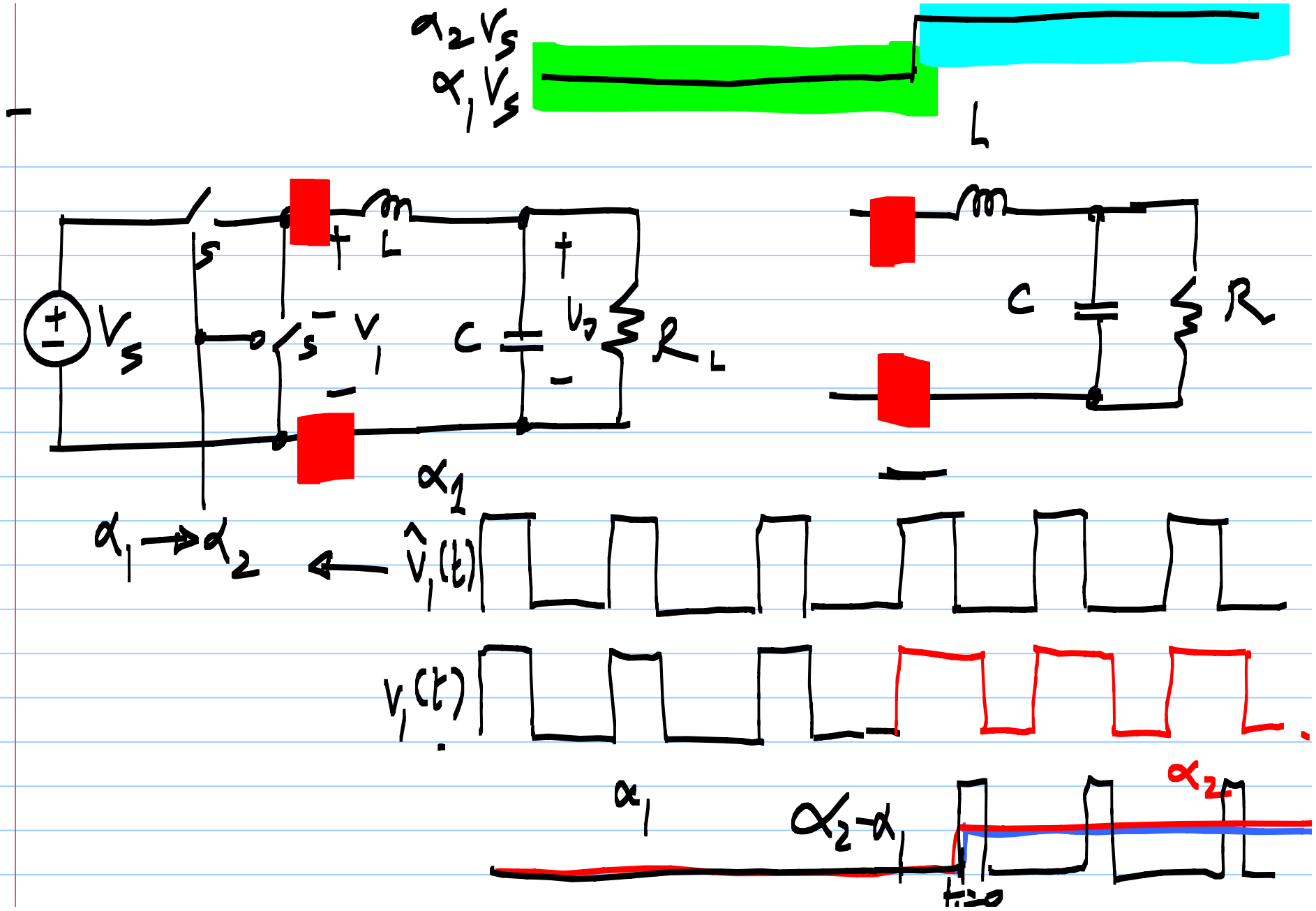
$$\frac{1/LC}{\left(s + \frac{1}{2CR}\right)^2 + \left[\frac{1}{LC} - \left(\frac{1}{2CR}\right)^2\right]}$$

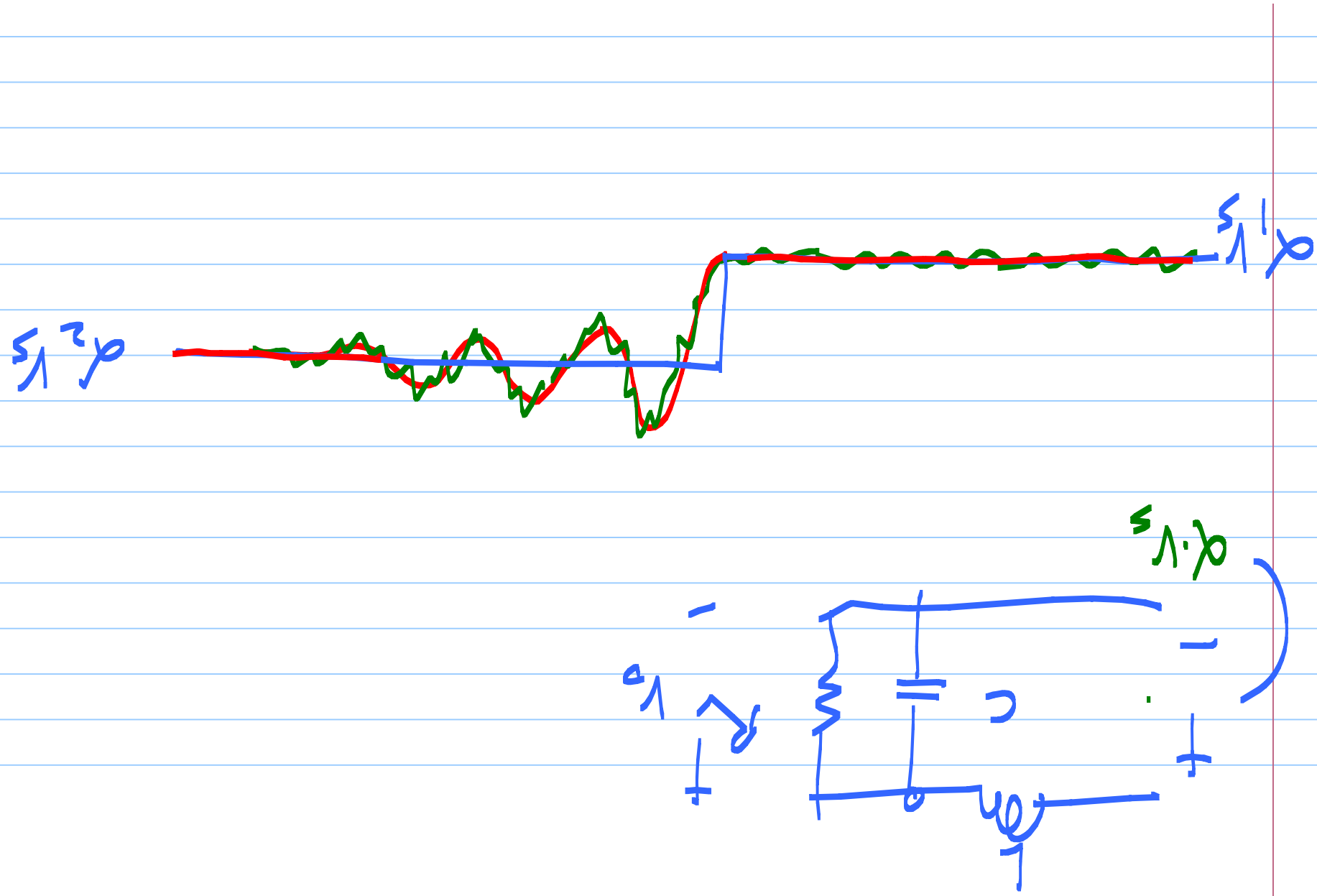
$$\frac{k}{(s+\sigma)^2 + \omega^2}$$

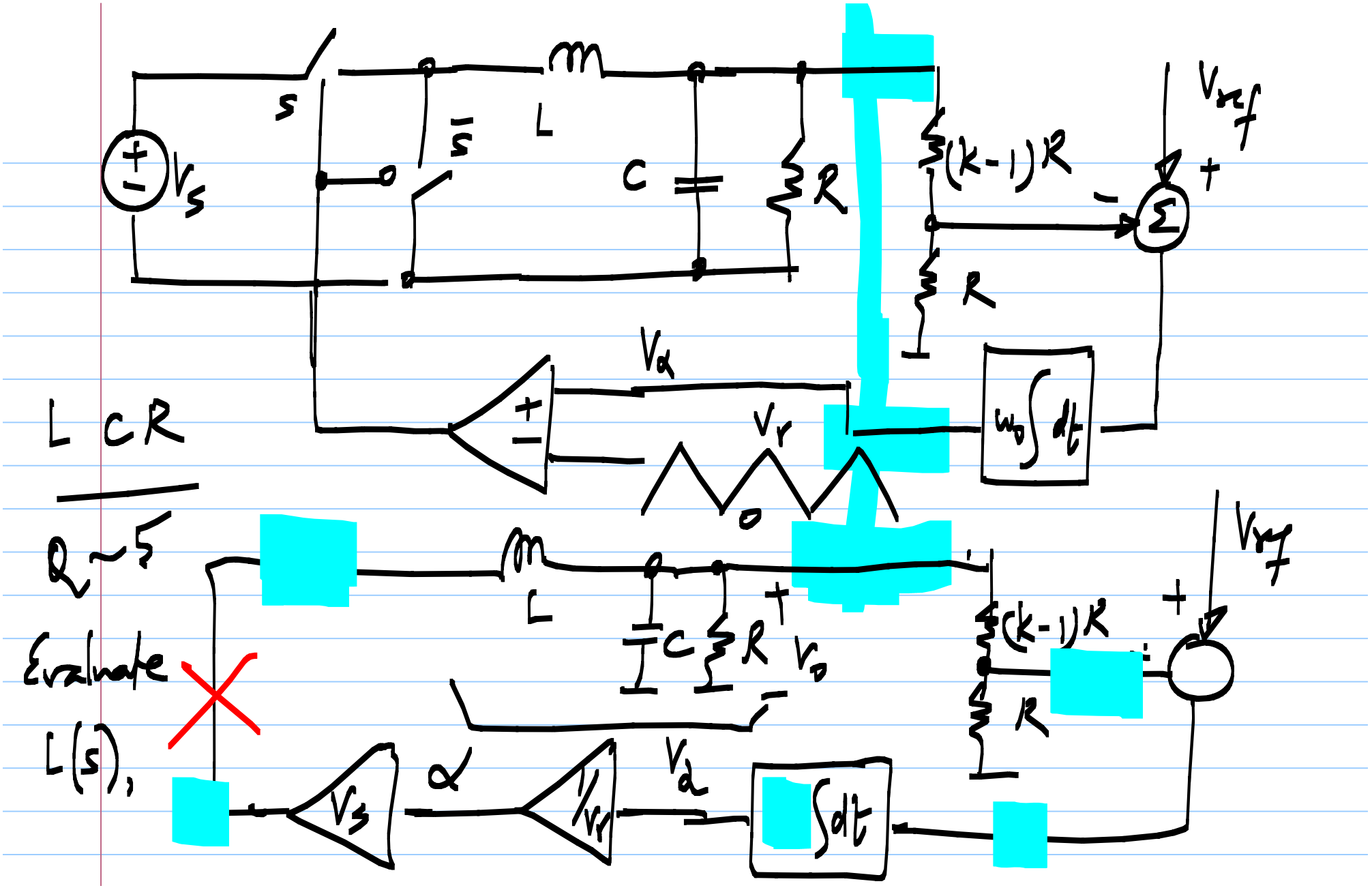
$$\exp(-\sigma t)\sin(\omega t)$$




1
0
$(\alpha_2-\alpha_1)v_s$
0
v_s


$\alpha_2 V_s$
$\alpha_1 V_s$
L
S
L
V_s
S_2
V_1
C
V_2
R_L
C
R
α_1
$\alpha_1 \to \alpha_2$
$\hat{V}_1(t)$
$V_1(t)$
α_1
$\alpha_2 - \alpha_1$
α_2
t=0




s
$\bar{s}$
L
C
R
V_s
$(k-1)R$
R
V_{ref}
V_d
V_r
$\omega_0 \int dt$
L C R
Q ~ 5
Evaluate
L(s),
α
$\int dt$

$$L(s) = \frac{1}{K} \cdot \frac{V_c}{V_y} \cdot \frac{\quad}{s} \cdot \frac{1}{1 + sL/R + s^2 LC}$$

$$\frac{\quad}{\quad} \quad \frac{\quad}{\text{max. value of this part}}$$