$$v = \frac{dw}{dq} \qquad i = \frac{dq}{dt} \qquad p(t) = v(t)i(t) \qquad w = \int_{t_1}^{t_2} p(t)\,dt$$

V = R x I **ΣIin = ΣIout** **ΣV = 0**

$$R_{EQ} = \sum_{n=1}^{N} R_n$$

$$\mathbf{R_{EQ} = \frac{R_1 R_2}{R_1 + R_2}} \qquad \mathbf{V_{R2} = Vi\ \frac{R_2}{R_1 + R_2}} \qquad \mathbf{I_{R2} = \frac{R_1}{R_1 + R_2}\ Ii}$$

$$V_{med} = \frac{1}{T}\int_{t_0}^{t_0+T} v(t)dt \qquad V_{ef} = V_{rms} = \sqrt{\frac{1}{T}\int_{t_0}^{t_0+T} v^2(t)dt}$$

$$\mathbf{V_{ef} = V_{rms} = \frac{V_m}{\sqrt{2}}}$$

ω = 2πf = 2π/T **τ = RC** **τ = L/R**

$$j^2 = -1$$

$$q_c = Cv_c \qquad i_c = C\frac{dv_c}{dt} \qquad v_c(t) = \frac{1}{C}\int_{t_0}^{t} i_c dt + v_c(t_0) \qquad w(t) = \frac{1}{2}Cv^2(t)$$

$$z = a + jb$$

$$|z| = \sqrt{a^2 + b^2}$$

$$v_L = L\frac{di_L}{dt} \qquad i_L(t) = \frac{1}{L}\int_{t_0}^{t} v_L dt + i_L(t_0) \qquad w(t) = \frac{1}{2}Li^2(t)$$

$$\phi = \tan^{-1}\left(\frac{b}{a}\right)$$

$$v_C(t) = V_i e^{-t/RC} \qquad v_C(t) = V_s - V_s e^{-t/RC} \qquad \mathbf{i_L(t) = I_f - I_f\, e^{-tR/L}}$$

$$Z_C = -j\frac{1}{\omega C} = \frac{1}{j\omega C} = \frac{1}{\omega C}\angle -90^\circ \qquad Z_L = j\omega L = \omega L\ \angle 90^\circ$$

$$f_B = \frac{1}{2\pi RC} \qquad H(f) = \frac{1}{1 + j(f/f_B)} \qquad H(f) = \frac{V_{out}}{V_{in}} = \frac{j(f/f_B)}{1 + j(f/f_B)}$$

$$|H(f)|_{dB} = 20\log|H(f)|$$

$Vr = I_{Lmed}$ T/C **$I_{Lmed} \approx V_{Lmed}/R_L$** **$Vr = I_{Lmed}$ T/2C**