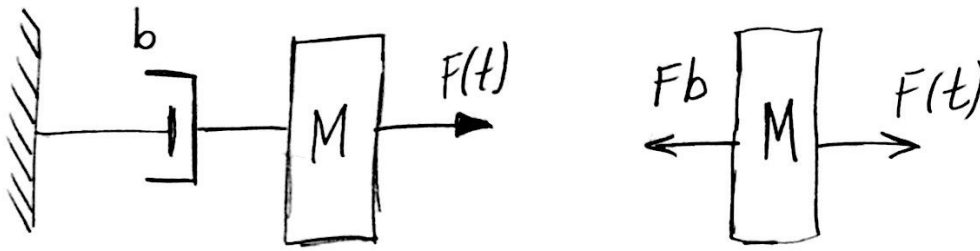
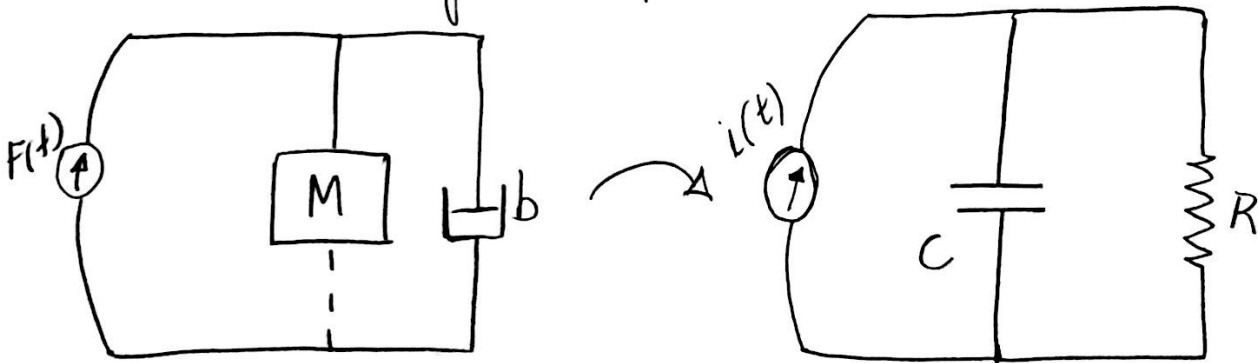


Ex. 1



Usando a analogia do tipo 2 para o cone do alto-falante:



Pelo método prático:

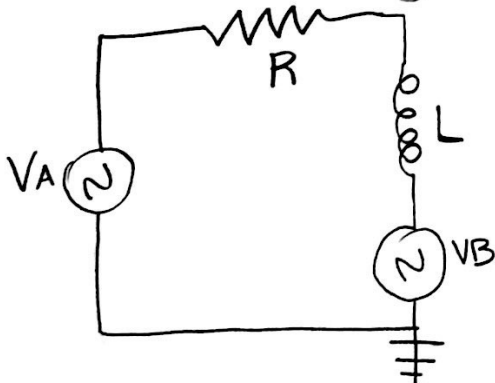
$$v\left(CD + \frac{1}{R}\right) = i(t)$$

↪ Pela analogia:

$$v(MD + b) = F(t) = B i l$$

$$\boxed{M\ddot{x} + b\dot{x} = B \cdot i l}$$

Para o alto-falante:



↪ Utilizando o método prático:

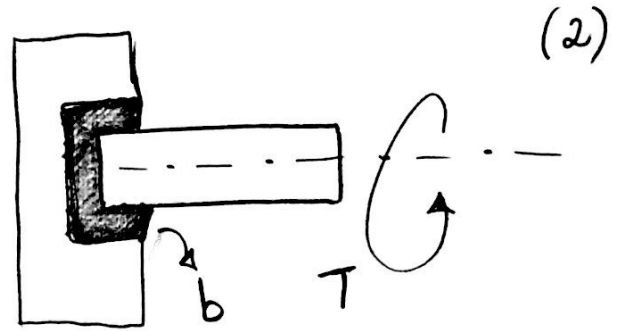
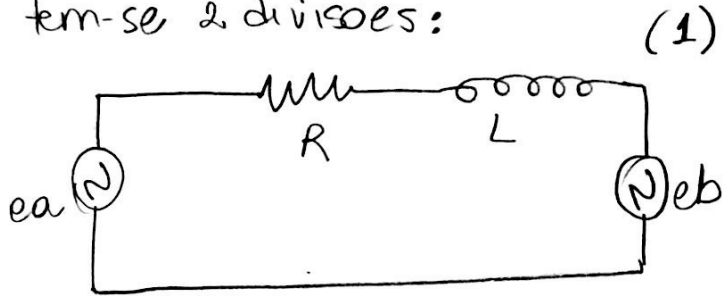
$$L D i + R i = V_A - V_B$$

$$L D i + R i = V_A - B l \dot{x}$$

$$\boxed{B l \dot{x} + L D i + R i = V_A}$$

### Ex. 2

Dado o sistema mecânico ilustrado na figura do exercício, tem-se 2 divisões:

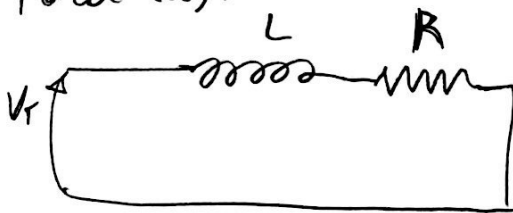


Para (1):

$$L \frac{di_a}{dt} + R i_a = e_a - e_b$$

$$L \frac{di_a}{dt} + R i_a = e_a - K_b \cdot w$$

Para (2):



$$\rightarrow L \frac{di}{dt} + R i = v$$

$$\downarrow$$
$$J \ddot{\theta} + b \dot{\theta} = v = K i_a$$