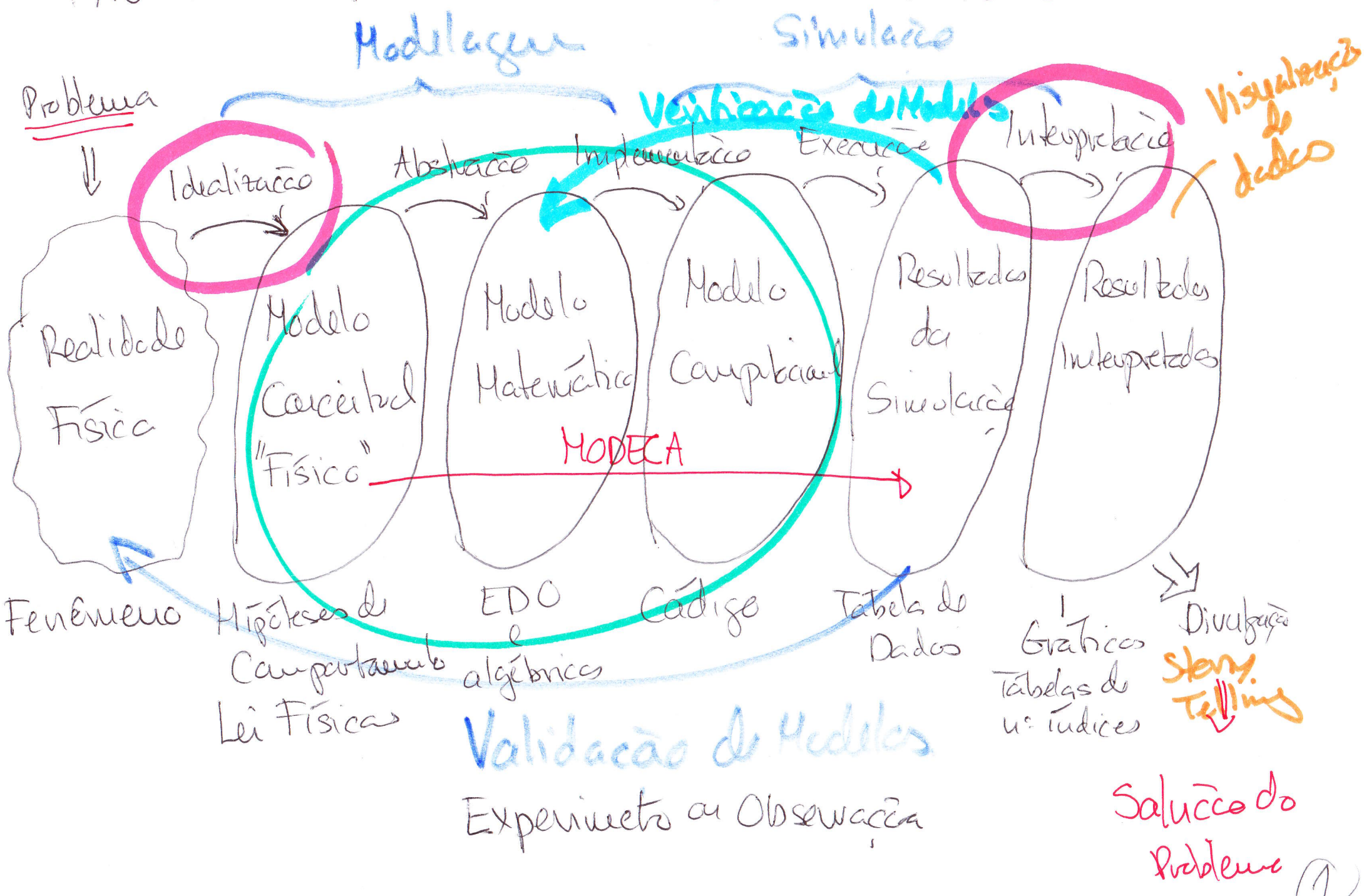
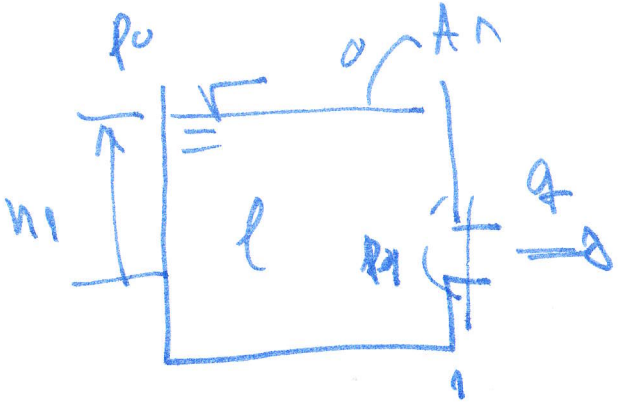
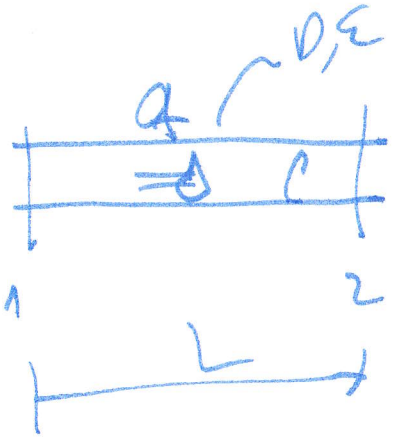
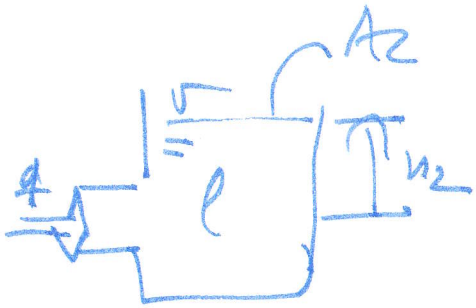
DME3201 Aula 3 Turma 22 02/10/2020









$$A_1 \frac{dh_1}{dt} = -q$$

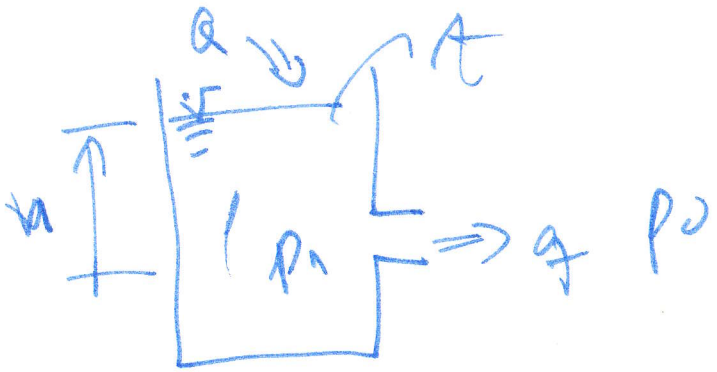
$$p_1 = p_0 + \rho g h_1$$

$$A_2 \frac{dh_2}{dt} = +q$$

$$p_2 = p_0 + \rho g h_2$$

$$p_1 - p_2 = Rq^2$$

$$p_1 > p_2 \qquad R = f(Re)$$



$$A\frac{dh}{dt} = -q + Q \quad \Rightarrow \quad \boxed{A\frac{dh}{dt} = -\sqrt{\frac{\rho g}{R}h} + Q}$$

E.D.O. no lineal

$$p_1 - p_0 = \boxed{Rq^2 = \rho g h}$$

$$p_1 = p_0 + \rho g h$$

linealización.

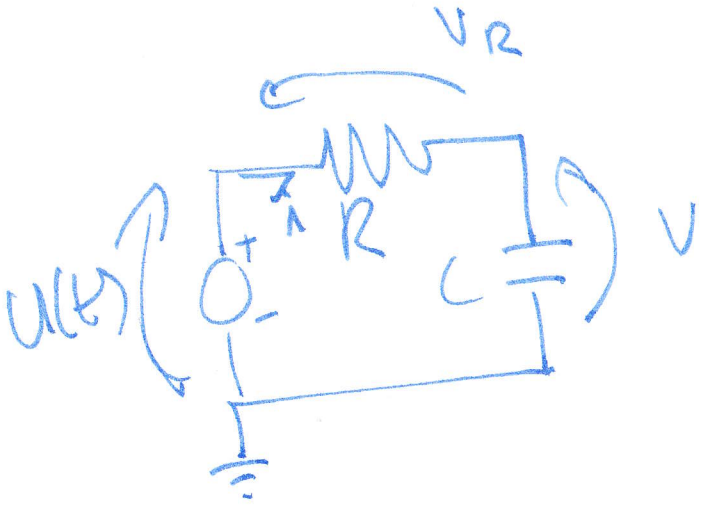
$$\rho g h = Rq^2 \Rightarrow \rho g h \simeq R q_0 q \rightarrow q = \frac{\rho g}{R q_0} h$$

P.P.: $q_0 = Q$, $q_0 = q(t_0)$

$$\boxed{A\frac{dh}{dt} + \frac{\rho g}{R q_0} \cdot h = Q}$$

E.D.O. linealizada

$$\tau = \frac{A R q_0}{\rho g}$$



$$\left.\begin{aligned} V_R &= R\,i \\ i &= C\frac{dV}{dt} \\ u(t) &= V_R + V \end{aligned}\right\}$$

$$R\,i + V = u(t)$$

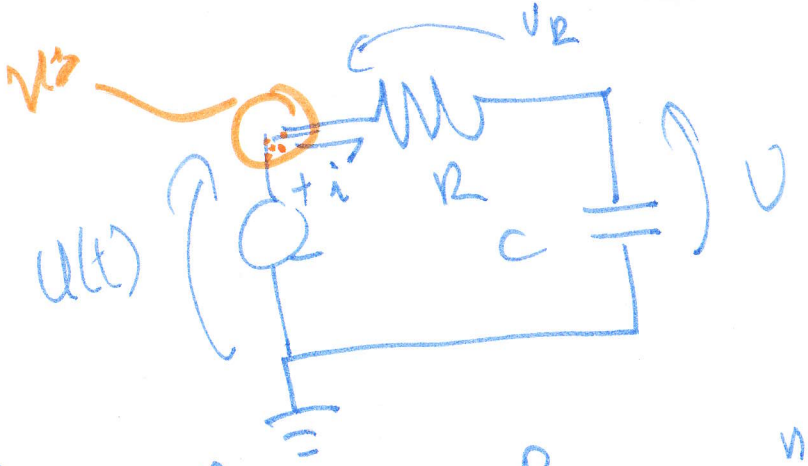
$$\boxed{RC\frac{dV}{dt} + V = u(t)}$$

E.D.O. 1'ordre linéa

$$u(t) = \begin{cases} 0 \;/\; t < t_0 \\ U_0 \;/\; t \geq t_0 \end{cases}$$

$$\boxed{\tau = RC}$$

excitateur échelon.

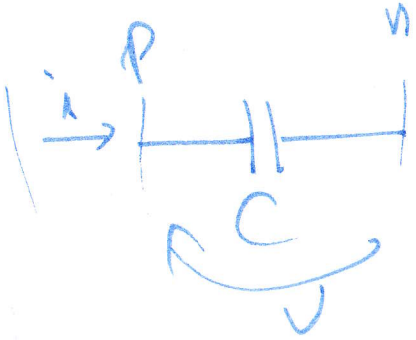


$V = Ri$

$i = p_0 \cdot i$

$V = p_0 v - n \cdot v$

$p \cdot i + n \cdot i = 0$

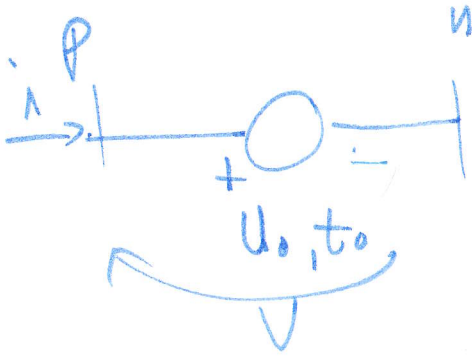


$i = C \frac{dv}{dt}$

$i = p \cdot i$

$V = p \cdot v - n \cdot v$

$p \cdot i + u \cdot i = 0$

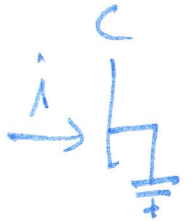


$V = \begin{cases} 0 & t < t_0 \\ u_0 & t \geq t_0 \end{cases}$

$i = p \cdot i$

$V = p \cdot v - n \cdot v$

$p \cdot i + u \cdot i = 0$



$C \cdot v = 0$ //

$\forall i \in \mathbb{R}$