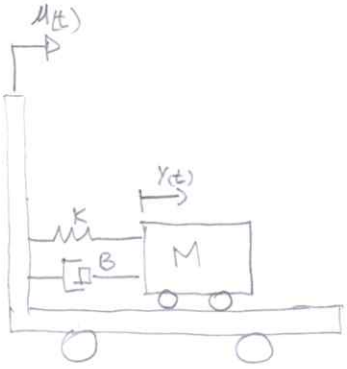
2f)



$$\frac{Y(s)}{U(s)}$$

Funções

$$\begin{cases} M - u(t) - x_t - x \\ Y - y(t) \\ U - U(s) - X(s) - X \\ Y - Y(s) \end{cases}$$

$F_R = ma$

$$\begin{cases} M\ddot{y} = -K(y-x) - B(\dot{y}-\dot{x}) \\ \phi = (s^2M + K + sB)Y - (K+sB)X \end{cases}$$

$$(0) = \begin{bmatrix} -(K+sB) & s^2M+sB+K \end{bmatrix} \begin{matrix} X \\ Y \end{matrix}$$

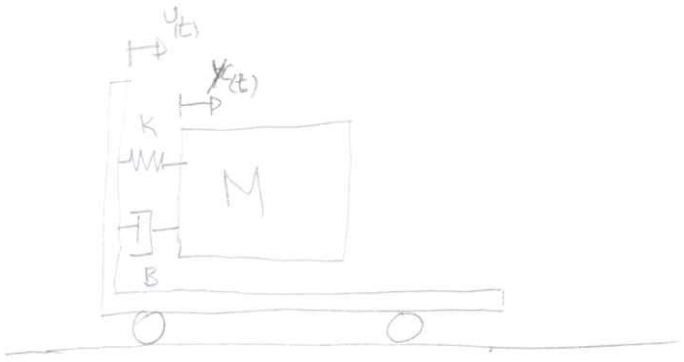
$$X(K+sB) = (s^2M + sB + K)\,Y$$

$$\boxed{Y = \frac{X(K+sB)}{s^2M+sB+K}}$$

Practice

$G(s) = \frac{Y(s)}{U(s)}$

2 s)



$$\sum F_R = M \ddot{x}_{(t)}$$

$$-K(y-u) - B(\dot{y}-\dot{u}) = M\ddot{y}$$

$$-Ky + Ku - sBy + sBu = s^2 My$$

$$sBu + Ku = s^2 My + sBy + Ky$$

$$(sB+K)u = (s^2M + sB + K)y$$

$$\frac{sB+K}{s^2M+sB+K} = \frac{y}{u}$$

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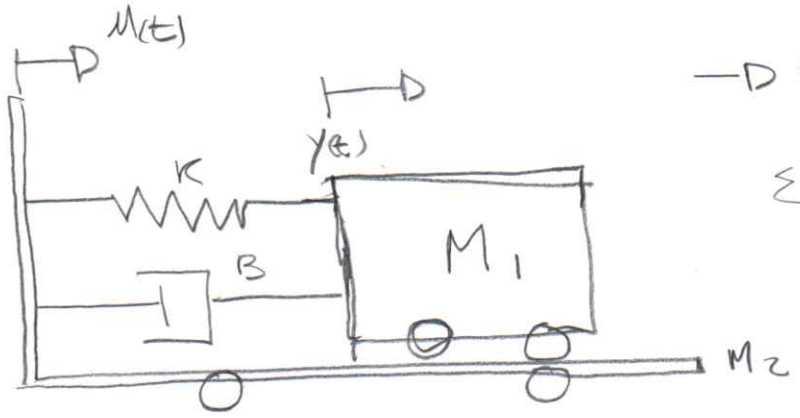
2 f)



$\Sigma F_R = m\, a_{(t)}$

$$M_2 a_2 = -K\left(M(t) - y(t)\right) - B\left(\dot{M}(t) - \dot{y}(t)\right) + F(t)$$

$$M_1 a_1 = +K\left(y(t) - M(t)\right) + B\left(\dot{y}(t) - \dot{M}(t)\right)$$

Modelaco