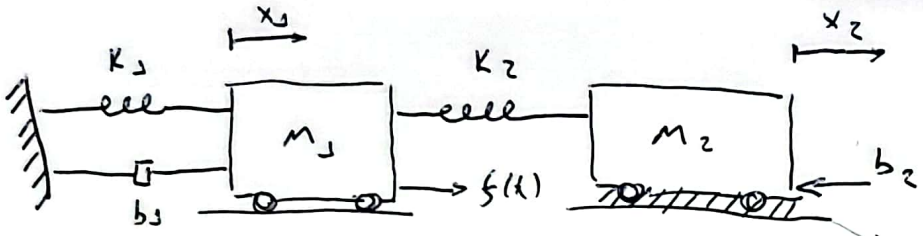
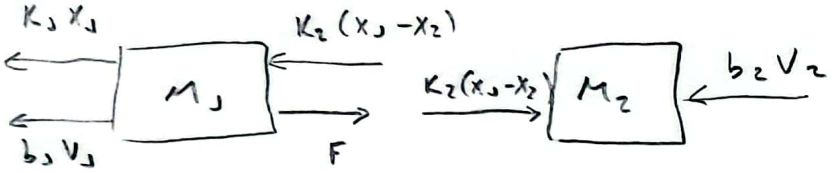


$$\frac{X_2(s)}{F(s)} = ?$$

$F_k = K\,x$

$F_b = b\,\dot{x}$



$F_1 = M_1 a_1$

$M_1 a_1 = F - K_1 x_1 - b_1 v_1 - K_2(x_1 - x_2)$

$M_1 \ddot{x}_1 = F - K_1 x_1 - b_1 \dot{x}_1 - K_2 x_1 + K_2 x_2$

$M_1 s^2 X_1(s) =$

$F(s) - K_1 X_1(s) - b_1 s X_1(s) - K_2 X_1(s) + K_2 X_2(s)$

$(M_1 s^2 + b_1 s + (K_1 + K_2))\, X_1(s) - K_2 X_2(s) = F(s)$

$$\frac{X_2(M_1 s^2 + b_1 s + (K_1 + K_2))(M_2 s^2 + b_2 s + K_2)}{K_2} - K_2 X_2 = F$$

$$X_2\left(\frac{(M_1 s^2 + b_1 s + K_2 + K_1)(M_2 s^2 + b_2 s + K_2) - K_2^2}{K_2}\right) = F$$

$$\frac{X_2(s)}{F(s)} = \frac{K_2}{(M_1 s^2 + b_1 s + (K_1 + K_2))(M_2 s^2 + b_2 s + K_2) - K_2^2}$$

$F_2 = M_2 a_2$

$M_2 a_2 = K_2(x_1 - x_2) - b_2 v_2$

$M_2 \ddot{x}_2 = K_2 x_1 - K_2 x_2 - b_2 \dot{x}_2$

$K_2 x_1 = M_2 \ddot{x}_2 + b_2 \dot{x}_2 + K_2 x_2$

$$x_1 = \frac{M_2 \ddot{x}_2}{K_2} + \frac{b_2 \dot{x}_2}{K_2} + \frac{K_2 x_2}{K_2}$$

$$X_1(s) = X_2(s)\,\frac{(M_2 s^2 + b_2 s + K_2)}{K_2}$$

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