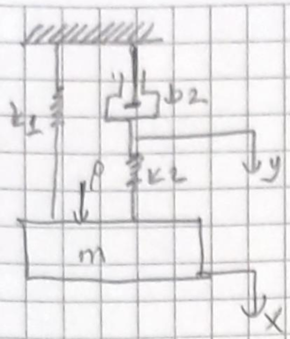

$T.F = \frac{X(s)}{P(s)}$

$$m\ddot{x} + k_1 x + k_2(x-y) = p$$

$$k_2(x-y) = b_2\dot{y}$$

$$\frac{Y(s)}{P(s)} = \frac{k_2}{b_2 s + k_2}$$

$$(ms^2 + k_1 + k_2)X(s) = k_2 Y(s) + P(s)$$

$$k_2 X(s) = (k_2 + b_2 s)Y(s)$$

$$(ms^2 + k_1 + k_2)X(s) = \frac{k_2^2}{k_2 + b_2 s} X(s) + P(s)$$

$$[(ms^2 + k_1 + k_2)(k_2 + b_2 s) - k_2^2]\,X(s) = (k_2 + b_2 s)\,P(s)$$

$$\frac{X(s)}{P(s)} = \frac{b_2 s + k_2}{m b_2 s^3 + m k_2 s^2 + (k_1 + k_2) b_2 s + k_1 k_2}$$

$m = 0.1\,kg$, $b_2 = 0.4\,N\text{-}s/m$, $k_1 = 6\,N/m$, $k_2 = 4\,N/m$ $\quad p(t) = 10N$

$$\frac{Y(s)}{P(s)} = \frac{Y(s)}{X(s)}\frac{X(s)}{P(s)} = \frac{k_2}{m b_2 s^3 + m k_2 s^2 + (k_1 + k_2) b_2 s + k_1 k_2}$$

$$\frac{X(s)}{P(s)} = \frac{0.4s + 4}{0.04s^3 + 0.4s^2 + 4s + 24} = \frac{10s + 100}{s^3 + 10s^2 + 100s + 600}$$

$$\frac{Y(s)}{P(s)} = \frac{4}{0.04s^3 + 0.4s^2 + 4s + 24} = \frac{100}{s^3 + 10s^2 + 100s + 600}$$

$p(t) = 10u(t)$, $u(t)$ unit-step input

$$\frac{X(s)}{u(s)} = \frac{100s + 1000}{(s^3 + 10s^2 + 100s + 600)s}$$

$$\frac{y(s)}{u(s)} = \frac{1000}{(s^3 + 10s^2 + 100s + 600)s}$$