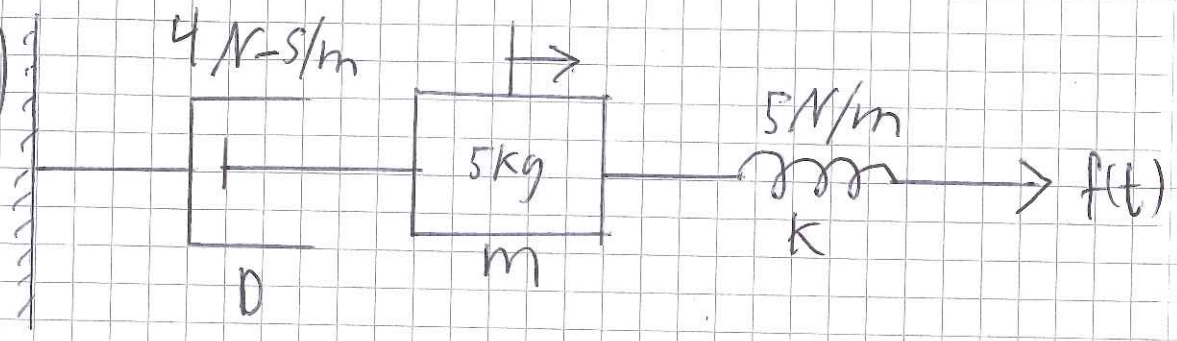
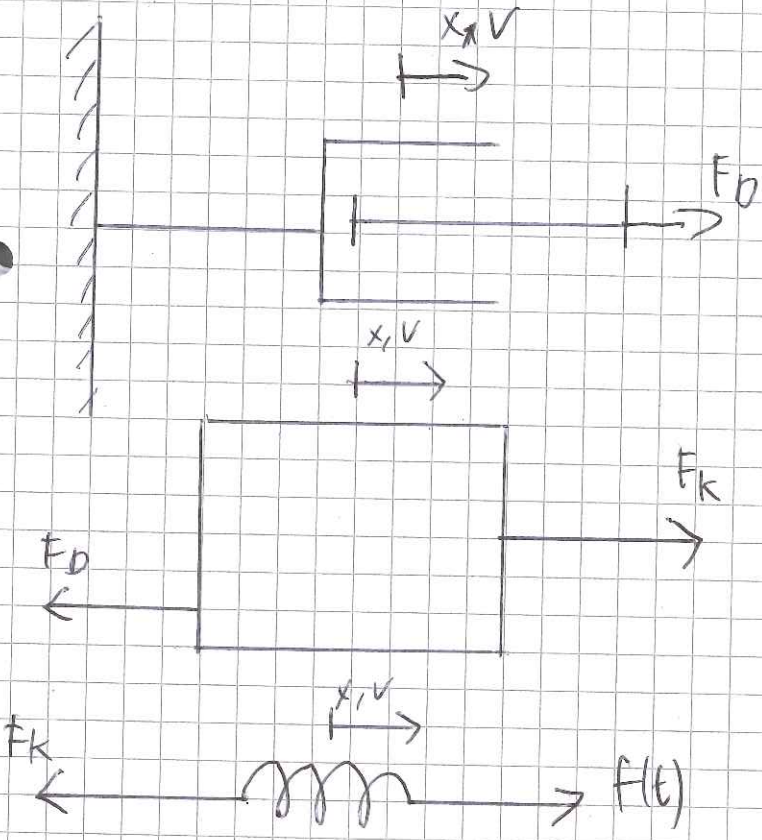
2) a)





$fm = F_k - F_D$, $F_D = D \cdot \dot{x}$, $F_k = f(t) - kx$

$= m \cdot \ddot{x}$

$f(t) = m \cdot \ddot{x} + D\dot{x} + k \cdot x$

$m \cdot \ddot{x} = f(t) - kx - D\dot{x}$

$F(s) = m s^2 X + D s x + k x$

$\frac{X(s)}{F(s)} = \frac{1}{m s^2 + D s + k}$