1. \[ F_T = F_1 = F_2 \]
   \[ X_T = X_1 + X_2 \]

\[ F_1 = Kx_1 \quad F_2 = bx_2 \]
\[ \dot{x}_1 = \frac{F_1}{K} \quad \dot{x}_2 = \frac{F_2}{b} \]
\[ \dot{X}_T = \frac{\dot{F}_1}{K} + \frac{\dot{F}_2}{b} \]

\[ kb \dot{X}_T = b \dot{F}_1 + kf_2 \]
\[ kb \dot{X} = b \ddot{F} + kF \]
#2

\[ F = kx + bx \]

\( t = 0 \)
\( f = 0 \)

\( t = 0^+ \)
\[ F = bx \]

\( t = t_1 \)
\[ F = kx + bx \]

\( t = t_1^+ \)
\[ f = kx - bx \]

\( t = t_2 \)
\[ f = -bx \]

#3

\[ d = 10 \text{ mm} \]

\[ F = kx + bv \]  \( t = 0 \)  \( F = kx \)

\[ F = \frac{10N}{10 \text{ mm}} + \frac{b \times 10 \text{ mm}}{s} \]

\( b = 20 \text{ kN/s} \)

\[ k = 10 \text{ kN/m} \]

\[ 100N = k \times 10 \text{ mm} \]