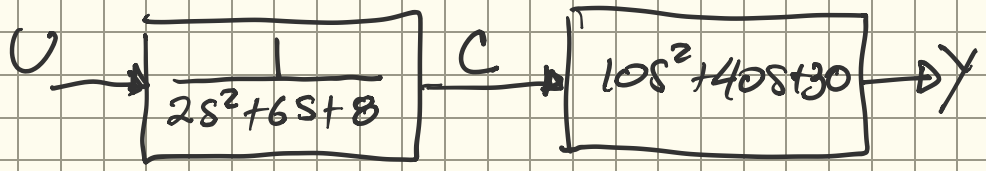
$$2\frac{d^2y}{dt^2} + 6\frac{dy}{dt} + 8y = 10\frac{d^2u}{dt^2} + 40\frac{du}{dt} + 30u$$

$\mathcal{L}$

$$2s^2y + 6sy + 8y = 10s^2u + 40su + 30u$$

$$\frac{Y}{U} = \frac{10s^2 + 40s + 30}{2s^2 + 6s + 8}$$



$x_1 = C$ $\quad$ d/dt $\quad$ $\dot{x}_1 = x_2$

$x_2 = \dot{x}_1 = \dot{C}$ $\quad$ $\dot{x}_2 = \ddot{C}$

$$2s^2C + 6sC + 8C = U$$

$2s^2C \to \dot{x}_2$, $6sC \to x_2$, $8C \to x_1$

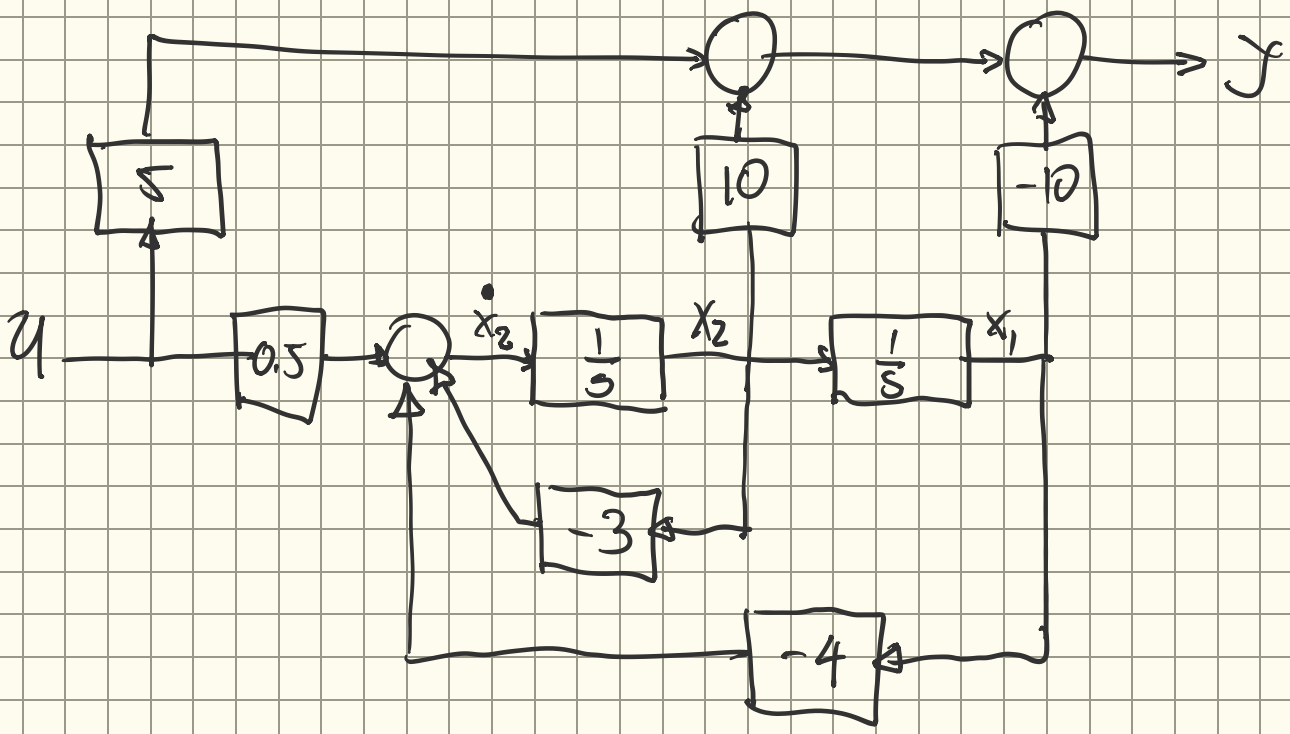
$$\dot{x}_2 = \frac{-8x_1 - 6x_2 + U}{2} = -4x_1 - 3x_2 + 0.5u$$

$$Y = 10s^2C + 40sC + 30C$$

$10s^2C \to \dot{x}_2$, $40sC \to x_2$, $30C \to x_1$

$$Y = 10[-4x_1 - 3x_2 + 0.5u] + 40x_2 + 30x_1$$

$$Y = -10x_1 + 10x_2 + 5u$$


y
5
10
-10
u
0.5
$\dot{x}_2$
$\frac{1}{s}$
x_2
$\frac{1}{s}$
x_1
-3
-4