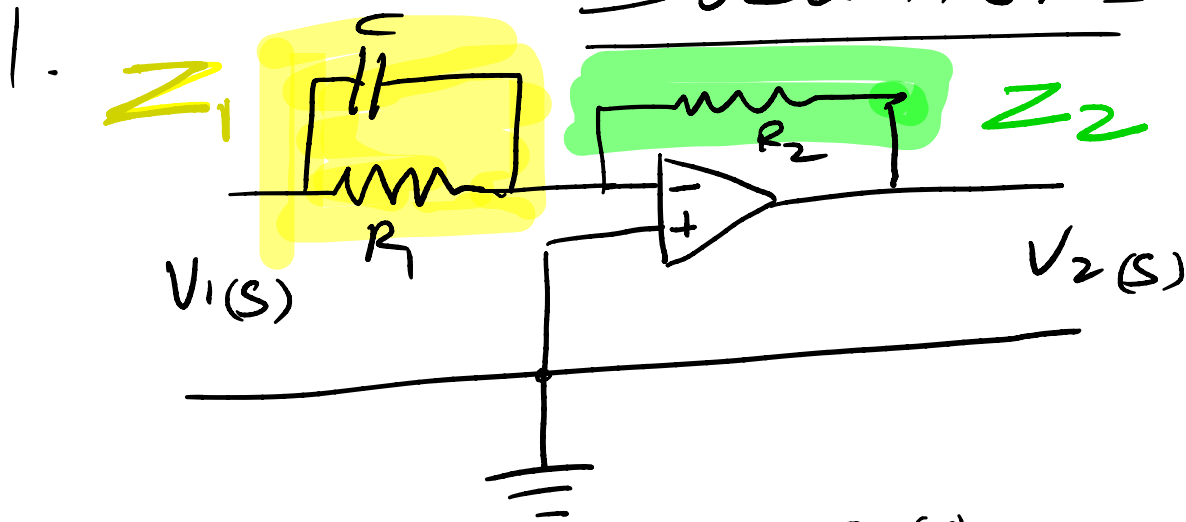


ELET 3220 ASSIGNMENT 1

SOLUTIONS



$$V_2(s) = -\frac{Z_2(s)}{Z_1(s)} V_1(s)$$

$$Z_1 = \frac{R_1 \left(\frac{1}{Cs} \right)}{R_1 + \frac{1}{Cs}} = \frac{\frac{R_1}{Cs}}{\frac{R_1 Cs + 1}{Cs}} = \frac{R_1}{\cancel{Cs}} \cdot \frac{\cancel{Cs}}{R_1 Cs + 1}$$

$$Z_1 = \frac{R_1}{R_1 Cs + 1}$$

$$V_2(s) = -\frac{R_2}{\frac{R_1}{R_1 Cs + 1}} V_1(s)$$

$$G(s) = \frac{V_2(s)}{V_1(s)} = - \frac{R_2 (R_1 C s + 1)}{R_1}$$

$$2. \quad \frac{Y_s}{R_s} = \frac{10(s+2)}{s^2 + 8s + 15}$$

$$Y_s = \frac{10(s+2)}{s(s+5)(s+3)} R(s)$$

$$10(s+2) = A(s+5)(s+3) + B s(s+3) + C s(s+5)$$

$$\text{LET } s = 0$$

$$10(2) = A(5)(3)$$

$$A = \frac{20}{15} = 1.33$$

$$\text{LET } s = -5$$

$$10(-3) = B(-5)(-2)$$

$$B = \frac{-30}{10} = -3$$

$$\text{LET } s = -3$$

$$10(-1) = C(-3)(2)$$

$$C = \frac{-10}{-6} = 1.67$$

$$Y(s) = \frac{1.33}{s} - \frac{3}{s+5} + \frac{1.67}{s+3}$$

$$y(\tau) = 1.33 - 3e^{-5\tau} + 1.67e^{-3\tau}$$

FOR ANSWER TO QUESTION
3

WATCH MY YOUTUBE VIDEO
AND RECORDING OF
LECTURE 9