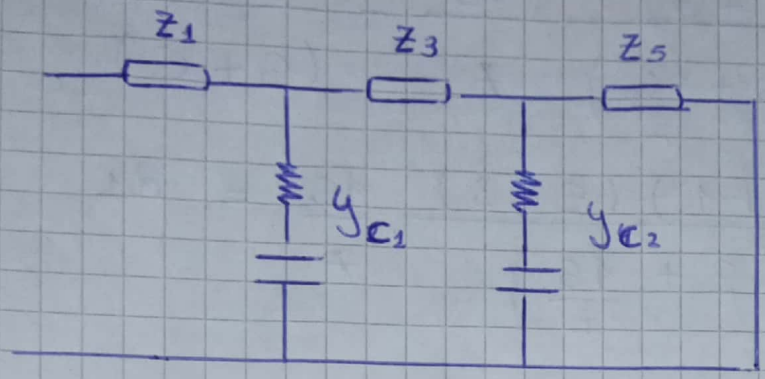
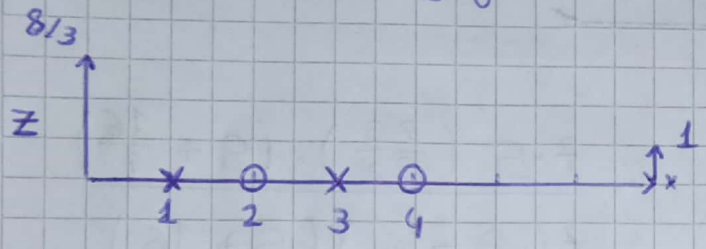
TS 11

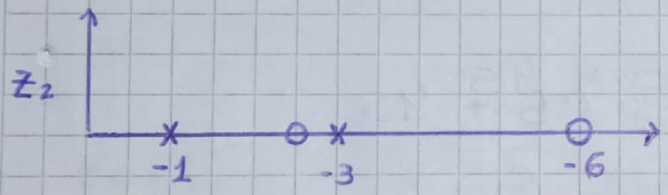


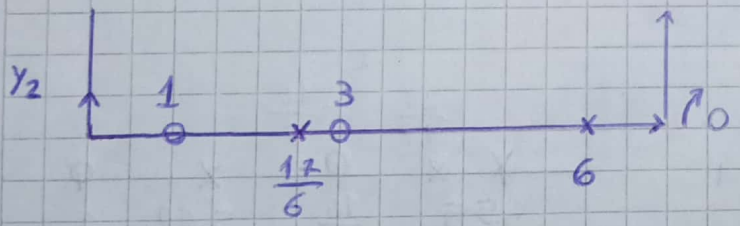
$$Z(S) = \frac{(S^2 + 6 \cdot S + 8)}{(S^2 + 4 \cdot S + 3)}$$

$$Z(S) = \frac{(S+2)(S+4)}{(S+1)(S+3)}$$

analisis metodo grafico







$$Z_2\Big|_{S=-6} = Z\Big|_{S=-6} - R_\infty' = 0$$

$$R_\infty = Z\Big|_{S=-6} = \frac{8}{15}$$

$$Z_1 = \frac{8}{15}$$

$$Z_2 = \frac{(S+2)(S+4)}{(S+1)(S+3)} - \frac{8}{15}$$

$$Z_2 = \frac{(S^2 + 6 \cdot S + 8) \cdot 15 - 8(S^2 + 4 \cdot S + 3)}{15(S^2 + 4 \cdot S + 3)}$$

$$Z_2 = \frac{7S^2 + 58 \cdot S + 96}{15 \cdot S^2 + 60 \cdot S + 45} = \frac{\left(S + \frac{16}{7}\right)(S+6)\,7}{(S+1)(S+3)\,15}$$

Para sacar la y_{c1} invierto el Z_2 para remover 6

$$y_{21}(S) = \frac{(S+1)(S+3)}{(S+6)(S+\frac{16}{7})} \frac{15}{7} - \frac{S K_1}{(S+6)}$$

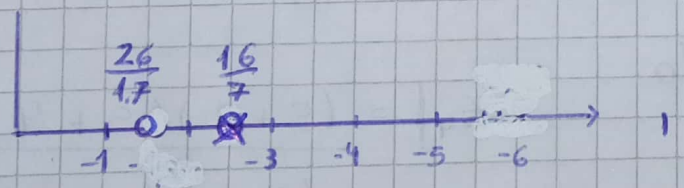
$$\lim_{S \to -6} y_{21}(S) = 0 \Rightarrow \frac{(S+1)(S+3)}{S\cdot(S+\frac{16}{7})} \frac{15}{7} = K_1$$

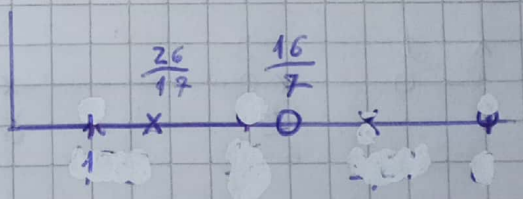
$$K_1 = \frac{15}{156} \frac{15}{7} \Rightarrow K_1 = \frac{75}{52}$$

$$y_{21}(S) = \frac{\frac{15}{7}(S^2+4\cdot S+3)}{(S+6)(S+\frac{16}{7})} - \frac{7\cdot S\,(\frac{75}{52})\cdot(S+\frac{16}{7})}{7(S+6)(S+\frac{16}{7})}$$

$$y_4(S) = \frac{(15-\frac{525}{52})\cdot S^2 + (60-\frac{300}{13})\cdot S + 45}{7(S+6)(S+\frac{16}{7})}$$

y_4





$$y_4 = = \frac{(S+\frac{26}{17})(S+6)\cdot(\frac{255}{52})}{7(S+6)(S+\frac{16}{7})} = \frac{(\frac{255}{52})(S+\frac{26}{17})}{7(S+\frac{16}{7})}$$

$$Z_4 = \frac{7\cdot 52}{255} \frac{(S+\frac{16}{7})}{(S+\frac{26}{17})}$$

Siendo $R_2 C_2 = \frac{2}{7}$

$$\lim_{S \to -\frac{7}{2}} Z_6 = \frac{364\left(S + \frac{16}{7}\right)}{255\left(S + \frac{26}{17}\right)} = Z_3$$

$$Z_3 = \frac{364}{255} \cdot \frac{\left(+\frac{17}{14}\right)}{+\frac{67}{34}} = \frac{884}{1005}$$

$$Z_6 = \frac{364\left(S + \frac{16}{7}\right)}{255\left(S + \frac{26}{17}\right)} - \frac{884}{1005}$$

$$Z_6(S) = \frac{364 \cdot S - 255 \cdot \frac{884}{1005} \cdot S + 255 \cdot \frac{884}{1005} \cdot \frac{26}{17} + 832}{\left(S + \frac{26}{17}\right) \cdot 255}$$

$$Z_6(S) = \frac{\frac{9360}{67} \cdot S + \frac{32760}{67}}{255\left(S + \frac{26}{17}\right)} = \frac{\frac{9360}{67}\left(S + \frac{7}{2}\right)}{255\left(S + \frac{26}{17}\right)}$$

$$Y_6(S) = \frac{1139\left(S + \frac{26}{17}\right)}{624\left(S + \frac{7}{2}\right)}$$

$$\lim_{S \to -\frac{7}{2}} \frac{\left(S + \frac{7}{2}\right)}{S} \cdot \frac{1139\left(S + \frac{26}{17}\right)}{624\left(S + \frac{7}{2}\right)} = \frac{1139\left(-\frac{7}{2} + \frac{26}{17}\right)}{\left(-\frac{7}{2}\right) \cdot 624} = K_2$$

$$K_2 = \frac{4489}{4368} \cong 1{,}0277$$

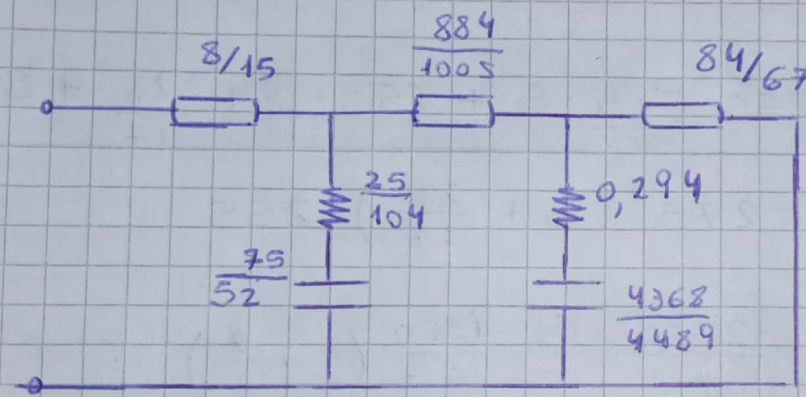
$$Y_8(s) = \frac{1139\left(s+\frac{26}{17}\right)}{624\left(s+\frac{7}{2}\right)} - \frac{s\left(\frac{4489}{4368}\right)\cdot 624}{\left(s+\frac{7}{2}\right)624}$$

$$Z_8(s) = \frac{1139\cdot s - \frac{4489}{7}\cdot s + 1742}{624\left(s+\frac{7}{2}\right)} = \frac{3484}{7}\cdot s + \ldots$$

$$Z_8(s) = \frac{\frac{3484}{7}\left(s+\frac{7}{2}\right)}{624\left(s+\frac{7}{2}\right)} = Y_3 = \frac{67}{84}$$

$$Z_3 = \frac{84}{67}$$

Finalmente

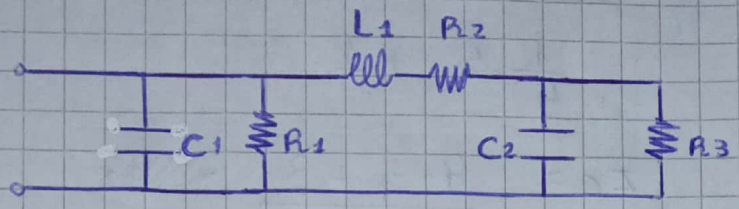


$$R_1 = \frac{1}{6}\cdot\frac{52}{75}$$

$$R_2 = \frac{2}{7}\cdot\frac{4489}{4368}$$

$$R_2 = \frac{4489}{15288} \cong 0{,}294$$

2. $Z(S) = \dfrac{(S^2 + S + 1)}{(S+1)(S^2 + 2\cdot S + 5)}$



$$y(S) = \frac{S^3 + 3\cdot S^2 + 7\cdot S + 5}{S^2 + S + 1}$$

1° Remuevo C_1

$$S^3 + 3\cdot S^2 + 7\cdot S + 5 \;\big|\; S^2 + S + 1$$
$$-S^3 + S^2 + 5 \qquad\qquad S \quad (y)$$
$$\overline{\qquad\qquad 2\cdot S^2 + 6\cdot S + 5}$$

2° Remuevo R_1

$$y_2(S) = \frac{S^3 + 3\cdot S^2 + 7\cdot S + 5}{S^2 + S + 1} - S$$

$$2\cdot S^2 + 6\cdot S + 5 \;\big|\; S^2 + S + 1 \qquad + y_2(S) = \frac{2\cdot S^2 + 6\cdot S + 5}{S^2 + S + 1}$$
$$-2\cdot S^2 + 2\cdot S + 2 \qquad 2 \quad (y)$$
$$\overline{\qquad 4\cdot S + 3}$$

$$R_1 = \frac{1}{2}$$

$$Z_4 = \frac{S^2 + S + 1}{4\cdot S + 3}$$

3° Bucle L_1

$$Z_4 = \frac{S^2 + S + 1}{4 \cdot S + 3}$$

$$\begin{array}{r|l} S^2 + S + 1 & 4 \cdot S + 3 \\ - S^2 + \frac{3}{4} \cdot S + 0 & \frac{1}{4} \cdot S \quad (z) \\ \hline \frac{1}{4} \cdot S + 1 & \end{array}$$

$$L_1 = \frac{1}{4} \cdot$$

4° Bucle R_2

$$Y_6 = \frac{\frac{1}{4} \cdot S + 1}{4 \cdot S + 3}$$

$$Z_6 = \frac{4 \cdot S + 3}{\frac{1}{4} \cdot S + 1}$$

$$\begin{array}{r|l} \frac{1}{4} \cdot S + 1 & 4 \cdot S + 3 \\ - \frac{1}{4} \cdot S + \frac{3}{16} & \frac{1}{16} \\ \hline 0 + \frac{13}{16} & \end{array} \rightarrow Z_2 = \frac{1}{16}$$

$$Z_6 = \frac{S^2 + S + 1}{4 \cdot S + 3} - \frac{S}{4} - \frac{1}{16}$$

$$Z_8 = \frac{13/16}{4 \cdot S + 3}$$

Repito el mismo procedimiento que el 1° y 2°

$$Z_8 = \frac{(13/16)}{4 \cdot S + 3}$$

$$\begin{array}{r|l} 4 \cdot S + 3 & 13/16 \\ - \frac{4 \cdot S}{3} & \frac{64}{13} \cdot S \quad (y) \end{array}$$

$$C_2 = \frac{64}{13}$$

$$\begin{array}{r|l} \frac{13}{16} & 3 \\ - \frac{13}{16} & \frac{13}{48} \quad (\not{z}) \\ \hline 0 & \end{array}$$

Finalmente

$C_1 = 1$ $\quad L_1 = \frac{1}{4}$ $\quad R_2 = \frac{1}{16}$

$C_2 = \frac{64}{13}$ $\quad R_1 = \frac{1}{2}$ $\quad R_3 = \frac{13}{48}$