

Übung zur Umrechnung für die Korrespondenztabelle

$$(1) \underline{U}_{(s)} = \frac{U_0}{s} * \frac{R}{(R+sL)}$$

$$(2) \underline{U}_{(s)} = \frac{U_0}{s} * \frac{\frac{1}{sC}}{\left(\frac{1}{sC} + R\right)}$$

$$(3) \underline{U}_{(s)} = \frac{U_0}{s} * \frac{sL}{(R+sL)}$$

$$(4) \underline{U}_{(s)} = \frac{U_0}{s} * \frac{R}{\left(R+L+\frac{LR}{s}\right)}$$

$$(5) \underline{U}_{(s)} = \frac{U_0}{s} * \frac{sL}{\left(sR+sL+\frac{s^2}{RL}\right)}$$

$$(6) \underline{U}_{(s)} = \frac{U_0}{s} * \frac{1}{\left(R+L+\frac{1}{sC}\right)}$$

$$(7) \underline{U}_{(s)} = \frac{U_0}{s} * \frac{sLR}{\left[s\left(R+L+\frac{1}{sC}\right)\right]}$$

Lösungen

$$(1) \frac{U_0}{s} \cdot \frac{R}{(R+sL)} \cdot \frac{1}{L} = \frac{U_0}{s} \cdot \frac{\frac{R}{L}}{s + \frac{R}{L}} = \frac{U_0}{s} \cdot \frac{a}{s(s+a)}, \text{ mit } a = \frac{R}{L}$$

$$(2) \frac{U_0}{s} \cdot \frac{\frac{1}{sC}}{(\frac{1}{sC} + R)} \cdot s = \frac{U_0}{s} \cdot \frac{\frac{1}{C}}{sR + \frac{1}{C}} \cdot R = U_0 \cdot \frac{\frac{1}{CR}}{s(s + \frac{1}{CR})} = U_0 \cdot \frac{a}{s(s+a)}, \text{ mit } a = \frac{1}{CR}$$

$$(3) \frac{U_0}{s} \cdot \frac{sL}{(R+sL)} \cdot \frac{1}{L} = U_0 \cdot \frac{1}{s + \frac{R}{L}} = U_0 \cdot \frac{1}{s+a}, \text{ mit } a = \frac{R}{L}$$

$$(4) \frac{U_0}{s} \cdot \frac{R}{(R+L + \frac{LR}{s})} = U_0 \cdot \frac{R}{s(R+L) + LR} \stackrel{:(R+L)}{:(R+L)} = U_0 \cdot \frac{\frac{R}{R+L}}{s + \frac{LR}{R+L}} \cdot \frac{R+L}{R+L}$$

$$\stackrel{:(R+L)}{:(R+L)} = \frac{U_0 \cdot R}{R+L} \cdot \frac{1}{s + \frac{LR}{R+L}} = \frac{U_0 \cdot R}{R+L} \cdot \frac{1}{s+a}, \text{ mit } a = \frac{LR}{R+L}$$

$$(5) \frac{U_0}{s} \cdot \frac{sL}{(sR + sL + \frac{s^2}{RL})} \stackrel{:s}{:s} = \frac{U_0}{s} \cdot \frac{L}{(R+L + \frac{s}{RL})} \cdot RL = \frac{U_0}{s} \cdot \frac{RL^2}{s + RL(R+L)} \cdot \frac{R+L}{R+L}$$

$$= \frac{U_0 \cdot L}{R+L} \cdot \frac{RL \cdot (R+L)}{s(s + RL(R+L))} = \frac{U_0 \cdot L}{R+L} \cdot \frac{a}{s(s+a)}, \text{ mit } a = RL(R+L)$$

$$(6) \frac{U_0}{s} \cdot \frac{1}{(R+L + \frac{1}{sC})} \cdot s = \frac{U_0}{s} \cdot \frac{s}{s(R+L) + \frac{1}{C}} \stackrel{:(R+L)}{:(R+L)} = \frac{U_0}{R+L} \cdot \frac{1}{s + \frac{1}{C(R+L)}} = \frac{U_0}{R+L} \cdot \frac{1}{s+a},$$

mit $a = \frac{1}{C(R+L)}$

$$(7) \frac{U_0}{s} \cdot \frac{sLR}{s(R+L + \frac{1}{sC})} = U_0 \cdot \frac{LR}{s(R+L) + \frac{1}{C}} \stackrel{:(R+L)}{:(R+L)} = U_0 \cdot \frac{\frac{LR}{R+L}}{s + \frac{1}{C(R+L)}}$$

$$= \frac{U_0 \cdot LR}{R+L} \cdot \frac{1}{s+a}, \text{ mit } a = \frac{1}{C(R+L)}$$