3 c)

$G(s) = \dfrac{30(s+2)}{s^2+17s+16} = \dfrac{30(s+2)}{(s+1)(s+16)}$

$\xi = 2,125$
$\omega_n = 4 \ (rad/sec)$
sobreamortecido

$K \Rightarrow \dfrac{30\left(\frac{s}{2}+1\right)\cdot 2}{(s+1)\,16\left(\frac{s}{16}+1\right)} = \dfrac{60\left(\frac{s}{2}+1\right)}{16\,(s+1)\cdot\left(\frac{s}{16}+1\right)}$

$K = \dfrac{60}{16} = \boxed{3,75}$

$Y(s) = \dfrac{30(s+2)}{(s+1)(s+16)}\cdot\dfrac{1}{s}$

$\xi > 1$
$16\times\dfrac{s^2}{4^2}+\dfrac{17}{16}s+1$

$= 30\,\dfrac{(s+1)+1}{(s+1)(s+16)\cdot s} = 30\left[\dfrac{(s+1)}{(s+1)(s+16)s} + \dfrac{1}{(s+1)(s+16)\cdot s}\right]$

$= 30\left[\dfrac{1}{s(s+16)} + \dfrac{1}{s\cdot(s+1)(s+16)}\right]$

$\begin{cases} A = \left.\dfrac{1}{s(s+16)}\cdot s\right|_{s=0} = \dfrac{1}{16} & \Rightarrow \ \dfrac{1}{s(s+16)} = \dfrac{\frac{1}{16}}{s} - \dfrac{\frac{1}{16}}{(s+16)} \\[4mm] B = \left.\dfrac{1}{s(s+16)}(s+16)\right|_{s=-16} = -\dfrac{1}{16} \end{cases}$

$\begin{cases} C = \left.\dfrac{1}{s(s+1)(s+16)}\cdot s\right|_{s=0} = \dfrac{1}{16} & \Rightarrow \ \dfrac{\frac{1}{16}}{s} - \dfrac{\frac{1}{15}}{(s+1)} + \dfrac{240}{(s+16)} \\[4mm] D = \left.\dfrac{1}{s(s+1)(s+16)}(s+1)\right|_{s=-1} = -\dfrac{1}{15} \\[4mm] E = \left.\dfrac{1}{s(s+1)(s+16)}(s+16)\right|_{s=-16} = \dfrac{1}{240} \end{cases}$

$G(s) = 30\left[\dfrac{\frac{1}{16}}{s} - \dfrac{\frac{1}{16}}{(s+16)} + \dfrac{\frac{1}{16}}{s} - \dfrac{\frac{1}{15}}{(s+1)} + \dfrac{240}{(s+16)}\right]$

$= \dfrac{\frac{15}{4}}{s} - \dfrac{\frac{30}{15}}{(s+1)} + \dfrac{\left(\frac{1}{240}-\frac{1}{16}\right)\cdot 30}{(s+16)}$

$\Rightarrow \dfrac{\frac{7}{4}}{s+16}$

$\dfrac{15}{4}u(t) - 2e^{-t} + \dfrac{7}{4}e^{-16t} \ , \ t\geq 0$