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1. $\Omega_\ell = 50\pi$ rad/s   Gain $= -2$ dB $\rightarrow$ $k_1 = -2$

   $\Omega_1 = 200\pi$ rad/s   Redaman $= -22$ dB $\rightarrow$ $k_2 = -22$

   $\Omega_2 = 850\pi$ rad/s

   $\Omega_u = 1000\pi$ rad/s

$$A = \frac{\Omega_1 (\Omega_u - \Omega_\ell)}{-\Omega_1^2 + \Omega_\ell \Omega_u} = \frac{200\pi (1000\pi - 50\pi)}{-(200\pi)^2 + 1000\pi \cdot 50\pi} = 19$$

$$B = \frac{\Omega_2 (\Omega_u - \Omega_\ell)}{-\Omega_2^2 + \Omega_\ell \Omega_u} = \frac{850\pi (1000\pi - 50\pi)}{-(850\pi)^2 + 50\pi \cdot 1000\pi} = -1,2$$

$\Omega_r = -1,2$

$$n = \left| \frac{\log_\omega \left[\frac{\omega^{0,2} - 1}{\omega^{2,2} - 1} \right]}{2 \cdot \log_\omega (-1,2)} \right| =$$
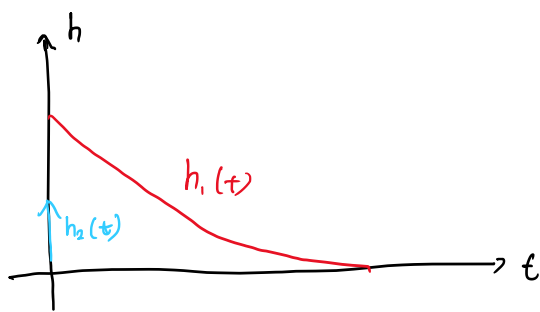
2. a. $h_1(t) = e^{-4t} \cdot u(t)$

$h_2(t) = 2\delta(t)$

$h_A(t) = h_1(t) * h_2(t)$

$h_A(t) = e^{-4t} \cdot u(t) \cdot 2\delta(t)$

$h_\beta(s) = \dfrac{1}{s+4} \cdot 2 = \dfrac{2}{s+4} = 2e^{-4t} u(t) = h_A(t)$

b. $h_3(t) = 5e^{-6t} u(t)$

$h_4(t) = u(t)$

$h_B(t) = 5e^{-6t} u(t) * u(t)$

$= \dfrac{5}{s+6} \cdot \dfrac{1}{s}$

$= \dfrac{5}{s(s+6)}$

$= \dfrac{A}{s} + \dfrac{B}{s+6} \longrightarrow A(s+6) + Bs = 5$

$\qquad\qquad\qquad\qquad (A+B)s + 6A = 5$

$= \dfrac{5}{6} \dfrac{1}{s} - \dfrac{5}{6} \dfrac{1}{s+6} \qquad\qquad A = \dfrac{5}{6}$

$\qquad\qquad\qquad\qquad\qquad\qquad B = -\dfrac{5}{6}$

$h_B(t) = \dfrac{5}{6} u(t) - \dfrac{5}{6} e^{-6t} u(t)$

c. $h(t) = h_A(t) + h_B(t)$

$\quad = 2e^{-4t} u(t) + \dfrac{5}{6} u(t) - \dfrac{5}{6} e^{-6t} u(t)$

d.