8.14 (a) $sY(s)+2Y(s)=X(s)$

$\Rightarrow H(s)=\frac{Y(s)}{X(s)}=\frac{1}{s+2}$, $Re[s]>-2$

(b) $h(t)=e^{-2t}u(t)$

$s(t)=\int_{-\infty}^{t}h(\tau)d\tau = u(t)\int_{0}^{t}e^{-2\tau}d\tau=\frac{1-e^{-2t}}{2}u(t)$

(c) $y_1(t)=\int_{-\infty}^{+\infty}x_1(\tau)h(t-\tau)=\int_{-\infty}^{+\infty}e^{-\tau}e^{2\tau-2t}u(t-\tau)d\tau$

$=\int_{-\infty}^{t}e^{\tau-2t}d\tau$

$=e^{-t}$

(d) $X_2(s)=\frac{1}{s+1}$, $Re[s]>-1$

$Y_2(s)=X_2(s)H(s)=\frac{1}{s+1}-\frac{1}{s+2}$, $Re[s]>-1$

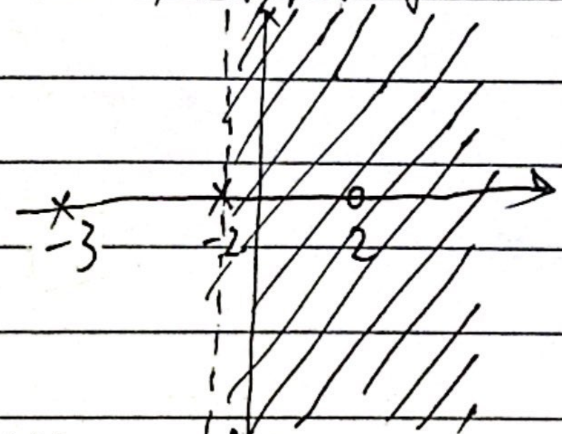
$y_2(t)=e^{-t}u(t)-e^{-2t}u(t)$

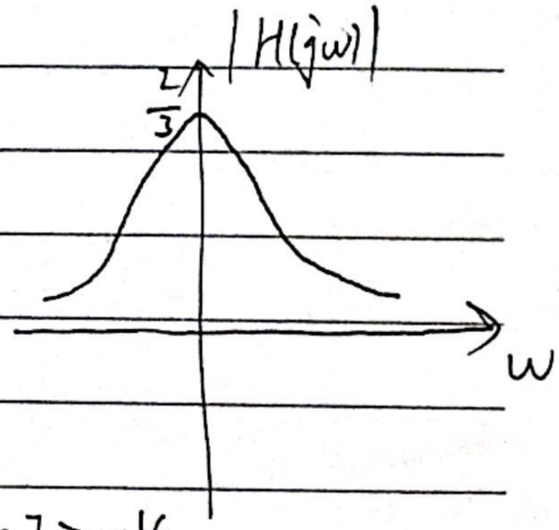
8.16 (a) $2\frac{X(s)}{s}-4\frac{X(s)}{s^2}=Y(s)+5\frac{Y(s)}{s}+6\frac{Y(s)}{s^2}$

$\Rightarrow H(s)=\frac{Y(s)}{X(s)}=\frac{2s-4}{s^2+5s+6}$ $Re[s]>-2$

(b) 稳定，因为$H(j\omega)$存在

(c)





(d) $X(s)=\frac{1}{s+4}$ $Re[s]>-4$

$Y(s)=X(s)H(s)=\frac{10}{s+3}-\frac{6}{s+4}-\frac{4}{s+2}$ $Re[s]>-2$

$y(t)=10e^{-3t}u(t)-6e^{-4t}u(t)-4e^{-2t}u(t)$