Hint (2.31)

Difference equation is

$$y[n] + \frac{1}{15} y[n-1] - \frac{2}{5} y[n-2] = x[n]$$

- For the homogeneous solution, find the roots, ρ_1 and ρ_2 of the homogeneous equation

$$\rho^2 + \frac{1}{15}\rho - \frac{2}{5} = 0$$

- Responses of this system have a general form

$$h[n] = A(\rho_1)^n + B(\rho_2)^n$$

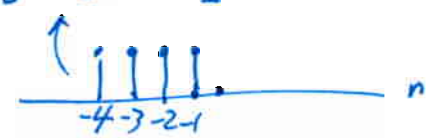
- ~~So~~ If the system is causal,

$$h_{causal}[n] = \left[A(\rho_1)^n + B(\rho_2)^n\right] u[n]$$

step function non-zero for $n \geq 0$

- If the system is anti-causal

$$h_{A\text{-}causal}[n] = \left[A(\rho_1)^n + B(\rho_2)^n\right] u[-n-1]$$



- For homogeneous solution, all $x[n]=0$, A, B just constant (verify that the sequence satisfies the homogeneous equation)

- For $h_{causal}[n]$, use the fact that $x[n] = \delta[n]$ to generate equations from which the value of A & B can be determined. E.g. at $n=0$, $h[0] = x[0] = A+B$

- For $h_{anticausal}[n]$, similarly, generate equations to determine A and B. E.g. at $n=0$, $h[0] + \frac{1}{15}h[-1] - \frac{2}{5}h[-2] = 1$, ← express this in A and B.