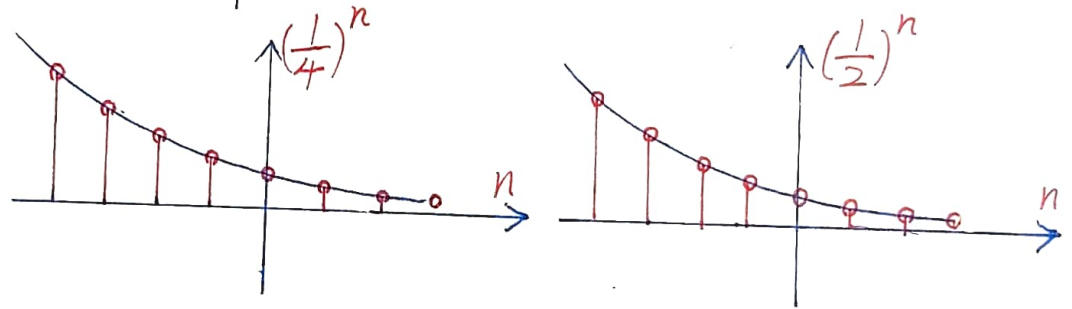
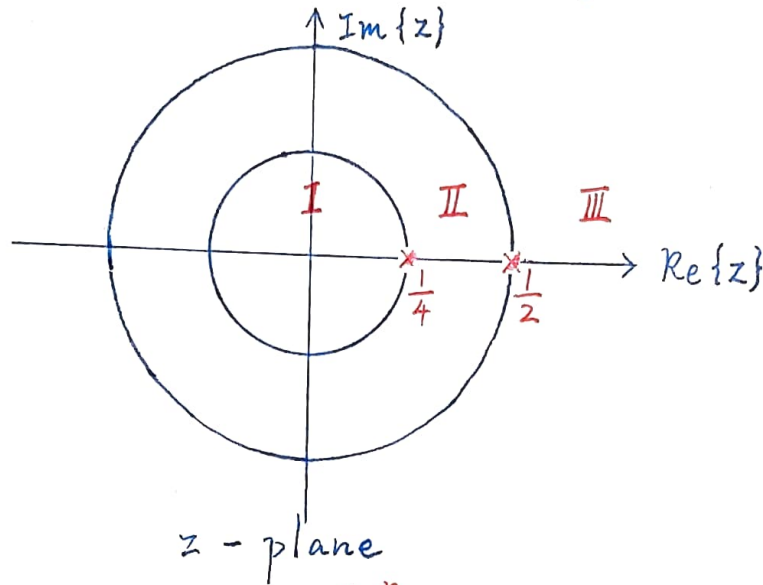


Problem 1

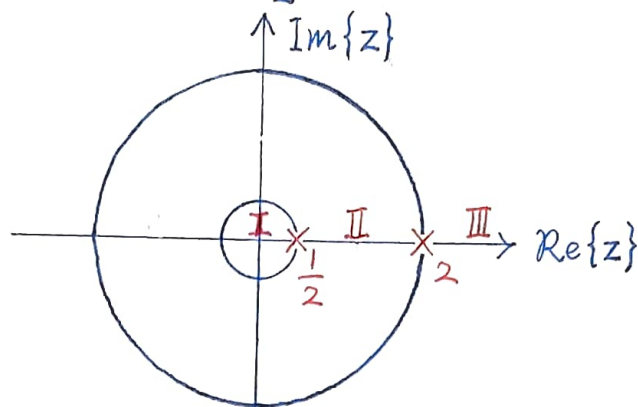
$$\begin{aligned}
 H(z) &= \frac{1}{1 - \frac{6}{8}z^{-1} + \frac{1}{8}z^{-2}} = \frac{1}{(1 - \frac{1}{4}z^{-1})(1 - \frac{1}{2}z^{-1})} \\
 &= \frac{2(1 - \frac{1}{4}z^{-1}) - (1 - \frac{1}{2}z^{-1})}{(1 - \frac{1}{4}z^{-1})(1 - \frac{1}{2}z^{-1})} \\
 &= -\frac{1}{1 - \frac{1}{4}z^{-1}} + 2\frac{1}{1 - \frac{1}{2}z^{-1}}
 \end{aligned}$$



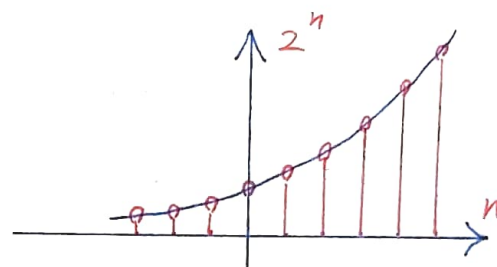
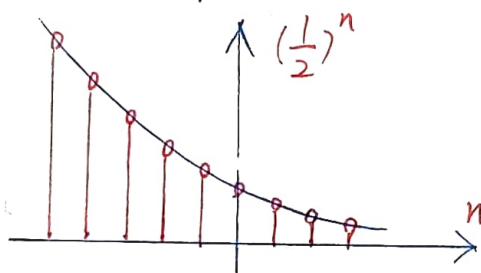
I	$ z < \frac{1}{4}$	$h[n] = -\left[-\left(\frac{1}{4}\right)^n u[-n-1]\right] + 2\left[-\left(\frac{1}{2}\right)^n u[-n-1]\right]$ <p>anti-causal not absolutely summable</p>
II	$\frac{1}{4} < z < \frac{1}{2}$	$h[n] = -\left[\left(\frac{1}{4}\right)^n u[n]\right] + 2\left[-\left(\frac{1}{2}\right)^n u[-n-1]\right]$ <p>non-causal not absolutely summable</p>
III	$\frac{1}{2} < z $	$h[n] = -\left[\left(\frac{1}{4}\right)^n u[n]\right] + 2\left[\left(\frac{1}{2}\right)^n u[n]\right]$ <p>causal absolutely summable</p>

Problem 2

$$\begin{aligned}
 H(z) &= \frac{1}{1 - \frac{5}{2}z^{-1} + z^{-2}} = \frac{1}{(1 - \frac{1}{2}z^{-1})(1 - 2z^{-1})} \\
 &= \frac{1}{3} \frac{4(1 - \frac{1}{2}z^{-1}) - (1 - 2z^{-1})}{(1 - \frac{1}{2}z^{-1})(1 - 2z^{-1})} \\
 &= -\frac{1}{3} \frac{1}{1 - \frac{1}{2}z^{-1}} + \frac{4}{3} \frac{1}{1 - 2z^{-1}}
 \end{aligned}$$



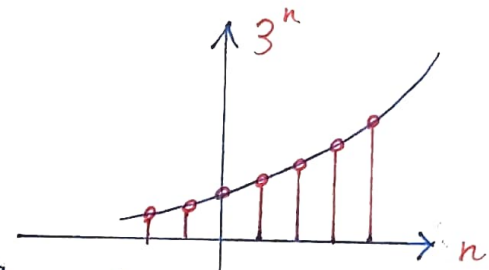
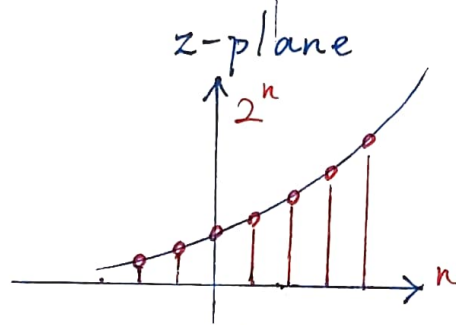
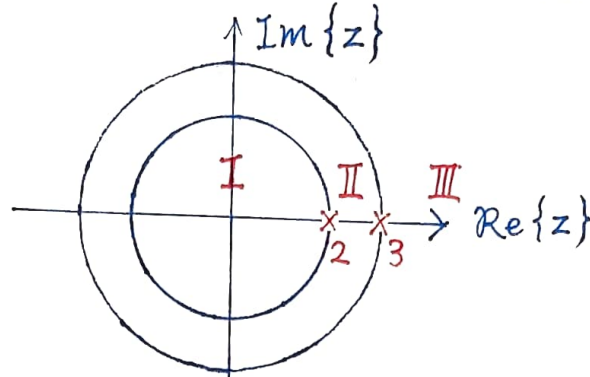
z-plane



I	$ z < \frac{1}{2}$	$h[n] = -\frac{1}{3} \left[-\left(\frac{1}{2}\right)^n u[-n-1] \right] + \frac{4}{3} \left[-2^n u[-n-1] \right]$ <p>anti-causal not absolutely summable</p>
II	$\frac{1}{2} < z < 2$	$h[n] = -\frac{1}{3} \left[\left(\frac{1}{2}\right)^n u[n] \right] + \frac{4}{3} \left[-2^n u[-n-1] \right]$ <p>non-causal absolutely summable</p>
III	$2 < z $	$h[n] = -\frac{1}{3} \left[\left(\frac{1}{2}\right)^n u[n] \right] + \frac{4}{3} \left[2^n u[n] \right]$ <p>causal not absolutely summable</p>

Problem 3

$$\begin{aligned}
 H(z) &= \frac{1}{1 - 5z^{-1} + 6z^{-2}} = \frac{1}{(1 - 2z^{-1})(1 - 3z^{-1})} \\
 &= \frac{3(1 - 2z^{-1}) - 2(1 - 3z^{-1})}{(1 - 2z^{-1})(1 - 3z^{-1})} \\
 &= -2 \frac{1}{1 - 2z^{-1}} + 3 \frac{1}{1 - 3z^{-1}}
 \end{aligned}$$



I	$ z < 2$	$h[n] = -2 \left[-2^n u[-n-1] \right] + 3 \left[-3^n u[-n-1] \right]$ <p>anti-causal</p>	$h[n] = -2 \left[-2^n u[-n-1] \right] + 3 \left[-3^n u[-n-1] \right]$ <p>absolutely summable</p>
II	$2 < z < 3$	$h[n] = -2 \left[2^n u[n] \right] + 3 \left[-3^n u[-n-1] \right]$ <p>non-causal</p>	$h[n] = -2 \left[2^n u[n] \right] + 3 \left[-3^n u[-n-1] \right]$ <p>not absolutely summable</p>
III	$3 < z $	$h[n] = -2 \left[2^n u[n] \right] + 3 \left[3^n u[n] \right]$ <p>causal</p>	$h[n] = -2 \left[2^n u[n] \right] + 3 \left[3^n u[n] \right]$ <p>not absolutely summable</p>

Problem 4

(1)

收斂區間在

最外面極點的外面

(2)

收斂區間包含單位圓