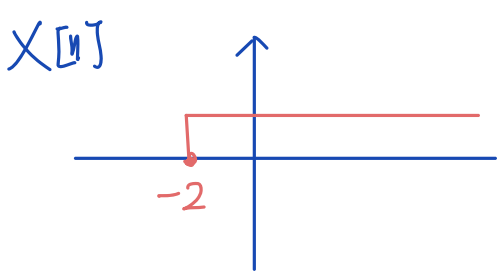
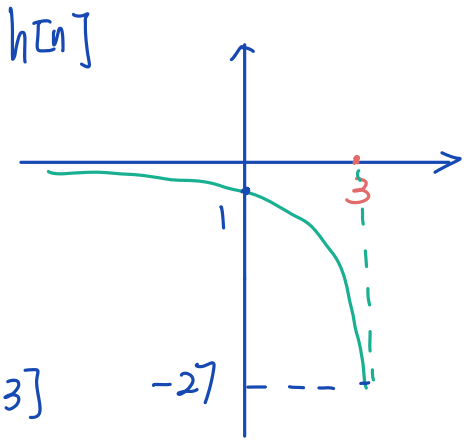
Problem 1.

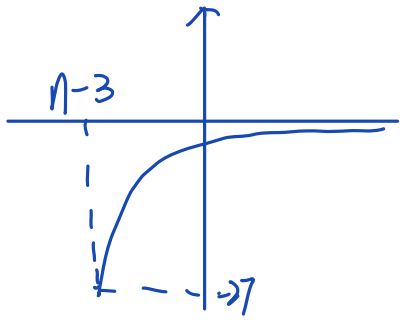




flip $h[n]$ $\quad h[n-k] = (-3)^{n-k}\, u[-n+k+3]$

$n-3 \le -2 \quad n \le 1$

$$\sum_{k=-2}^{\infty} (-3)^{n-k} = \frac{1}{4}(-1)^n \cdot 3^{n+3}$$



$n > 1$

$$\sum_{k=n-3}^{\infty} (-3)^{n-k} = -\frac{81}{4}$$

Problem 2

$$a_k = \frac{1}{T}\int_0^T x(t)\, e^{-jn\frac{2\pi}{T}t}\, dt \qquad w = 2\pi f = \frac{2\pi}{T}$$

$$= \frac{1}{T}\int_{-\frac{T}{2}}^{0} \cdot (-A)\, e^{-jn\frac{2\pi}{T}t}\, dt + \frac{1}{T}\int_0^{\frac{T}{2}} A \cdot e^{-jn\frac{2\pi}{T}t}\, dt$$

$$= \frac{-A}{T}\int_{-\frac{T}{2}}^{0} \left[\cos\left(n\cdot\frac{2\pi}{T}\cdot t\right) - j\sin\left(n\cdot\frac{2\pi}{T}\cdot t\right)\right] + \frac{A}{T}\int_0^{\frac{T}{2}} \left[\cos\left(n\cdot\frac{2\pi}{T}\cdot t\right) - j\sin\left(n\cdot\frac{2\pi}{T}\cdot t\right)\right]$$

$=$

problem 3.

(a) not causal when $t<0$ $h(t)\neq 0$

$\int_{-\infty}^{0} e^{t}\sin(-5t) = \frac{5}{26} < \infty$ stable

(b) causal, when $t<0$ $h(t)=0$

$\int_{0}^{\infty} \cos(3t)\,dt = \frac{\sin(\infty)}{3} + \frac{1}{3} < \infty$ stable

(c) causal, when $t<0$ $h(t)=0$

stable because e^{-t} converge to 0