

ECE 113 HW 5

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Problem 1

(a)

We have that

$$\cos(2\pi \frac{1}{8}n) = \frac{1}{2} \left(e^{j\pi \frac{1}{4}n} + e^{-j\pi \frac{1}{4}n} \right)$$

Therefore we have that

$$\cos(2\pi \frac{1}{8}n) \rightarrow \boxed{\frac{N}{2} (\delta(k-1) + \delta(k-7))}$$

(b)

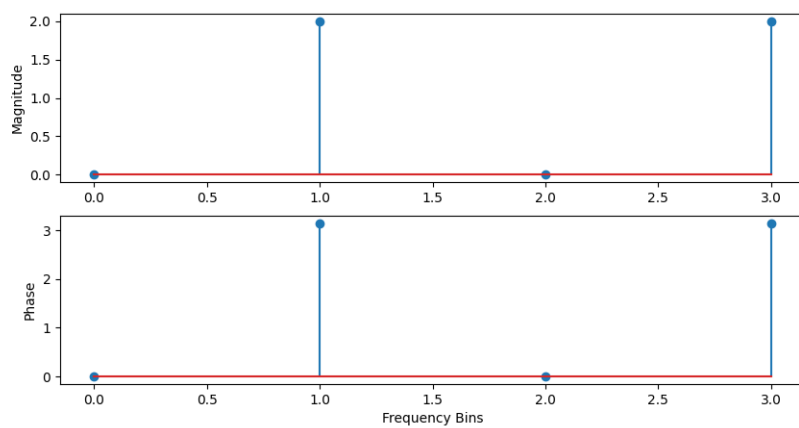
$$y_1[n] \rightarrow \boxed{2j \sin(\frac{2\pi}{4}k)}$$

(c)

$$y_2[n] \rightarrow \boxed{e^{j\frac{2\pi}{4}}}$$

Problem 2

$$y_3[n] \rightarrow \boxed{2j \sin\left(\frac{2\pi}{4}k\right) \left(2j + e^{j\frac{2\pi}{4}}\right)}$$



Problem 3