GATE ASSIGNMENT 4

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Download python codes from

https://github.com/Dishank422/EE3900/blob/main/quiz1/codes

and latex-tikz codes from

https://github.com/Dishank422/EE3900/blob/main/quiz1/latex_code.tex

1 Discrete Time Signal Processing 2.28(c)

Determine if $x[n] = ne^{j\pi n}$ is periodic. If it is periodic, determine it's period.

2 Solution

No the signal is not periodic. Note that the amplitude of the signal is n. Hence the amplitude is growing in time. If the signal is periodic, then it must have the same amplitude and phase after some time interval. Since the amplitude is monotonically increasing, the amplitude cannot be same at any later instant in time. Hence the signal is not periodic.

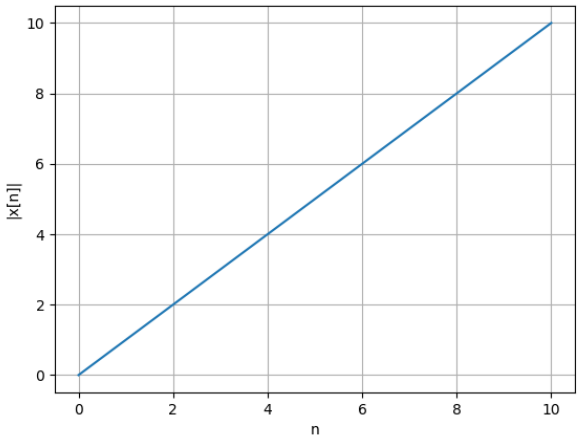

Fig. 0: Amplitude of x[n]

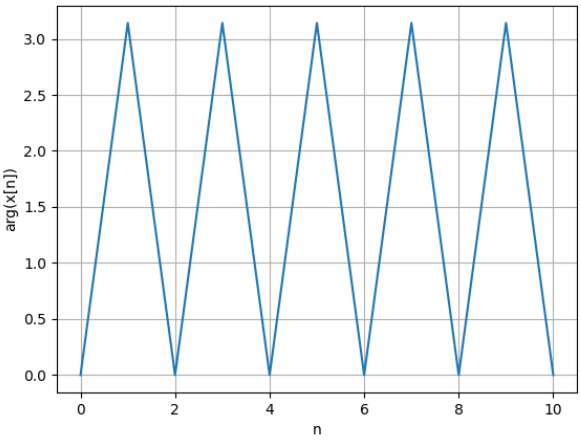

Fig. 0: Phase of x[n]