Gate Assignment

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Problem Statement

A finite impulse response (FIR) filter has only two non-zero samples in its impulse response $h[n]$, namely $h[0] = h[1] = 1$. The Discrete Time Fourier Transform (DTFT) of $h[n]$ equals $H(e^{j\omega})$, as a function of the normalized angular frequency ω. For the range $|\omega| \leq \pi$, $|H(e^{j\omega})|$ is equal to

(A) $2\,|\cos(\omega)|$

(B) $2\,|\sin(\omega)|$

(C) $2\left|\cos(\frac{\omega}{2})\right|$

(D) $2\left|\sin(\frac{\omega}{2})\right|$

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