DIGITAL SIGNAL PROCESSING: COSC390

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QUIZ 4

1. Imagine a sinusoidal signal at frequency $\nu = 1$ MHz, phase $\phi_1 = 45$ deg, with amplitude $A_1 = 1.5$ V described by a phasor: $z_1 = A_1 \exp(j\phi_1)$. Now imagine the signal passes through an LTI system with transfer function $r = A_2 \exp(j\phi_2)$, with $A_2 = 0.5$ and $\phi_2 = -45$ deg. What is the amplitude and phase of the signal after it passes through the system?
2. A single-pole low pass filter's transfer function is described by $R(\omega) = 1/(1 + j\omega\tau)$. What is the complex phase of this transfer function?
3. What is the group delay of the system in question 2?