Potentially Useful Formulas and Definitions

ECE 598NA, Quiz 1

August 28, 2006

Logarithm Tables

R	$\log_{10}(R)$
0.01	-2
0.1	-1
1	0
10	1
100	2

Cosine Tables (In order to find cosine of negative numbers, use the identity $\cos(-\phi) = \cos(\phi)$)

ϕ (Radians)	$\cos(\phi)$
0	1
$\pi/6$	$\sqrt{3}/2$
$\pi/4$	$\sqrt{2}/2$
$\pi/3$	$1/2$
$\pi/2$	0

Phase Delays

$$\begin{aligned}
\cos(\omega t - \pi/2) &= \sin(\omega t) \\
\cos(\omega t - \pi) &= -\cos(\omega t) \\
\cos(\omega t - 3\pi/2) &= -\sin(\omega t) \\
\cos(\omega t - 2\pi) &= \cos(\omega t)
\end{aligned}$$

Differential Calculus

$$x(t) = A\cos(\omega t - \phi) \quad \Leftrightarrow \frac{dx}{dt} = -\omega A \sin(\omega t - \phi) \Leftrightarrow \quad \frac{d^2x}{dt^2} = -\omega^2 A \cos(\omega t - \phi)$$

$$x(t) = Ae^{\alpha t} \qquad \Leftrightarrow \frac{dx}{dt} = \alpha A e^{\alpha t} \Leftrightarrow \qquad \frac{d^2x}{dt^2} = \alpha^2 A e^{\alpha t}$$