

EE 206: Homework #8

Sinusoidal Source, Complex Numbers, Complex Impedance. Due Monday, March 30th

Please make the subject "EE 206 HW#8" if submitting homework electronically to Jacob_Glower@yahoo.com (or on blackboard)

Sine Waves

1) Convert to V_p , V_{pp} , V_{rms}

V_p (peak)	V_{pp} (peak-to-peak)	V_{rms}
$15V_p$		
	$15V_{pp}$	
		$15V_{rms}$

2) Solve the following differential equation for $y(t)$

$$\frac{dy}{dt} + 3y = x$$

$$x(t) = 2 \cos(5t)$$

hint: assume $y(t)$ is in the form of

$$y(t) = a \cos(5t) + b \sin(5t)$$

substitute and match coefficients for sine and cosine.

Complex Numbers:

3) Find Y as a complex number

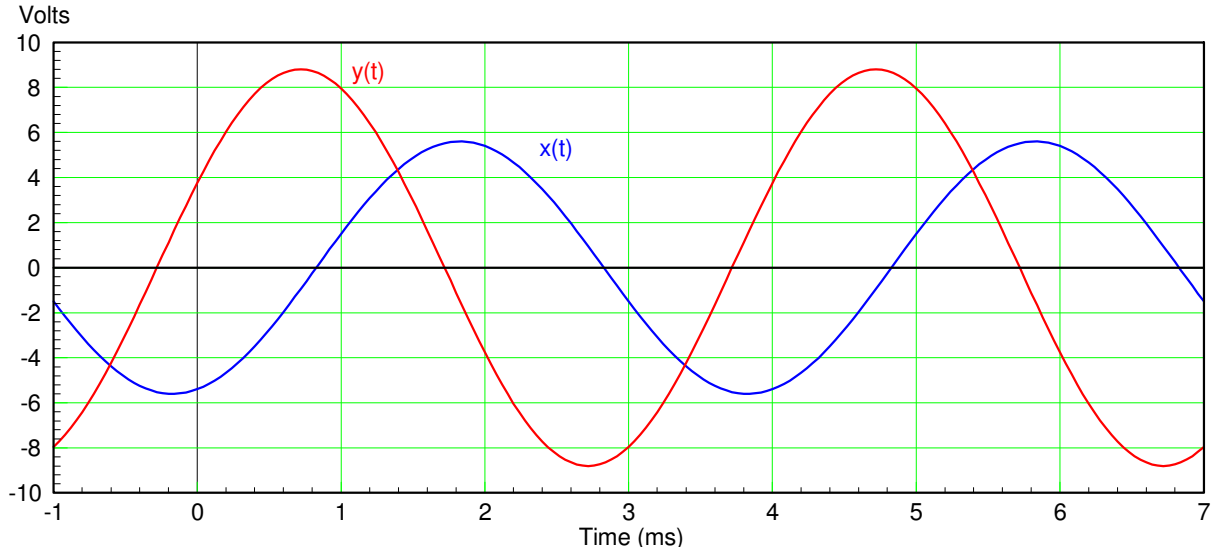
$$3a) \quad Y = \left(\frac{8+j3}{2+j7} \right) + \left(\frac{4-j3}{8+j5} \right)$$

$$3b) \quad Y = \left(\frac{100(s+3)}{s(s+5)(s+10)} \right)_{s=j3}$$

$$3c) \quad Y = \left(\frac{5s^2+10s+20}{s^3+6s^2+11s+6} \right)_{s=j4}$$

Phasor Voltages

- 4) For the following waveforms, determine
- The frequency in rad/sec
 - The phasor representation for X and Y



- 5) Express V in phasor form.

- a) $V = 6 \cos(10t) - 7 \sin(10t)$
 b) $V = 2 \cos(20t - 30^\circ) + 5 \cos(20t + 15^\circ)$
 c) $V = 7 \cos(5t - 20^\circ) + 9 \sin(5t)$

- 6) Assume $Y = G * X$. Determine frequency and the phasor representation for G

