1 Phasors as Rotating Vectors

$$\bullet Given:$$
$$i_L(t) = I_m sin(\omega t + \theta) \tag{1}$$
$$\bullet Recall:$$
$$v_L(t) = L\{di_L(t)/dt\} \tag{2}$$
$$\bullet Determine:$$
$$-The inductor voltage: v_L(t)$$

2 Complex Impedances Capacitance

$$X_L = jwL = j(500)(.3) = j150\omega \tag{3}$$
$$X_C = \frac{-j}{wc} = \frac{-j}{(500)(40x10^{-6}} = j - 50 \tag{4}$$
$$Z_{total} = 100 + j100 \tag{5}$$
$$V = IZ \tag{6}$$
$$I = \frac{V}{Z} \tag{7}$$
$$I = \frac{100\angle 30^\circ}{100 + j100} \tag{8}$$
$$= .707\angle -15^\circ \tag{9}$$
$$i(t) = (.707)cos(500t - 15^\circ) \tag{10}$$

Paralell

$$Z_{eq} = \frac{100(-j100}{100 - j100} = \frac{(100)(100\angle -90^\circ}{100 - j100} = 70.71\angle -45^\circ \tag{11}$$