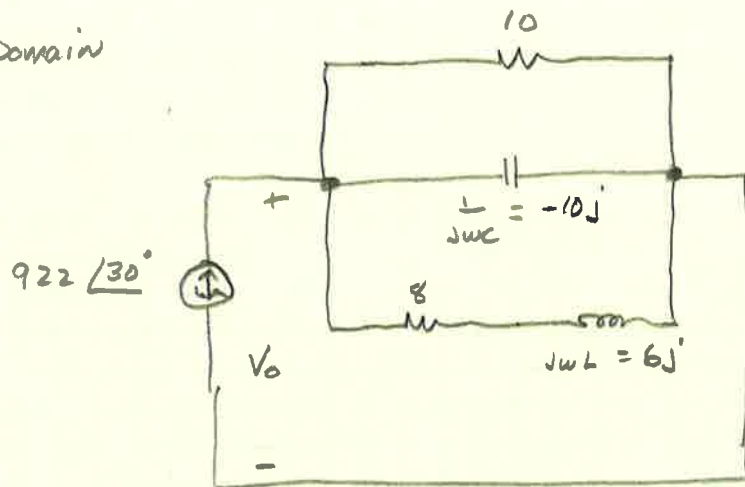


a) Draw the freq-domain circuit.

$$\omega = 20,000 \text{ Rad/sec}$$



b) Find V_o

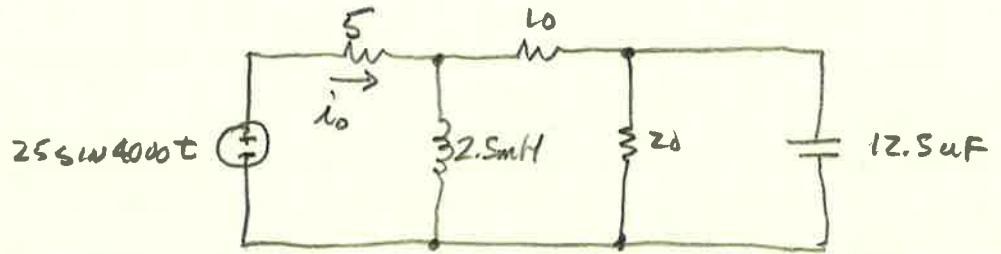
$$V_o = IZ = 922 \angle 30^\circ (10 \parallel -10j \parallel (2 + 6j))$$

$$= 922 \angle 30^\circ (5.42 \angle -12.53^\circ)$$

$$V_o = 5000.25 \angle 17.47^\circ \text{ V}$$

c) Find $V_o(t)$

$$V_o(t) = 5000.25 \cos(20,000t + 17.47^\circ) \text{ V}$$

Find $i_o(t)$.

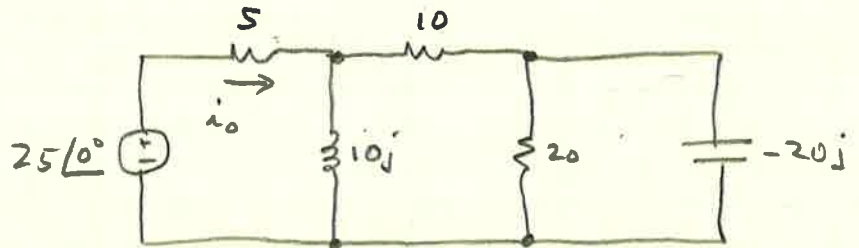
Convert to Frequency Domain

$$\omega = 4000$$

$$Z_L = j\omega L = 10j$$

$$Z_C = \frac{1}{j\omega C} = -20j$$

$$V_S = 25 \angle 0^\circ$$



$$Z_{eq} = 5 + [10j \parallel (10 + (20 \parallel -20j))] = 10 + j10 = 14.14 \angle 45^\circ \Omega$$

$$i_o = \frac{V}{Z} = \frac{25 \angle 0^\circ}{14.14 \angle 45^\circ} = 1.768 \angle -45^\circ \text{ A}$$

$$i_o(t) = 1.768 \sin(4000t - 45^\circ) \text{ A}$$

$$= 1.768 \cos(4000t - 135^\circ) \text{ A}$$