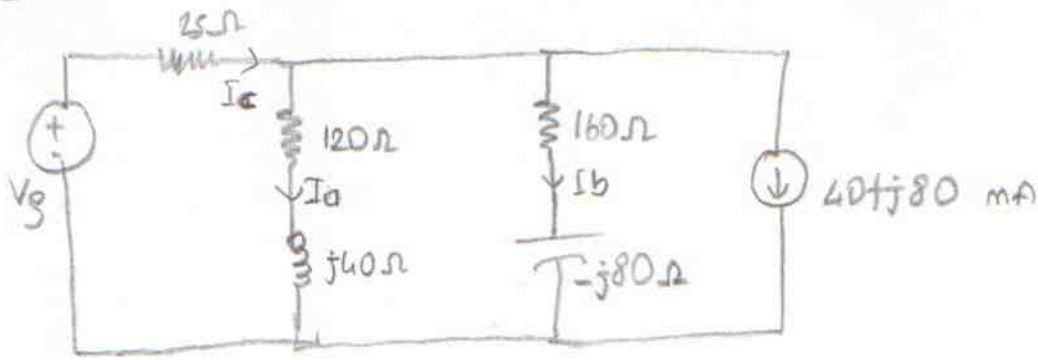


1



I_a fazör akımı 40 mA dir

a) I_b , I_c ve V_g 'yi bulunuz

b) $\omega = 800 \text{ rad/s}$ ise i_b , i_c ve v_g için durgun durum ifadelerini yazınız

c) fazör diyagramını çiziniz

a) $V_a = V_b = (120 + j40) I_a = (160 - j80) I_b$

$$(120 + j40) \cdot 40 \angle 0^\circ \cdot 10^{-3} = (160 - j80) I_b$$

$$\frac{126,5 \angle 18,43^\circ \cdot 40 \cdot 10^{-3} \angle 0^\circ}{178,88 \angle -26,56} = I_b$$

$$I_b = 28,28 \angle 45^\circ \text{ mA} //$$

$$I_c = I_a + I_b + 40 + j80$$

$$I_c = 40 + 120 + j20 + 40 + j80$$

$$I_c = 100 + j100 \text{ mA} = 141,42 \angle 45^\circ \text{ mA}$$

$$V_g = 25 I_c + (120 + j40) I_a$$

$$V_g = 25 + j2,5 + 4,8 + j1,6$$

$$V_g = 7,3 + j4,1 \text{ V}$$

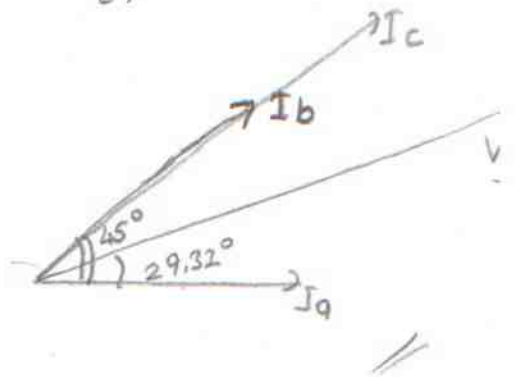
$$V_g = 8,37 \angle 29,32^\circ \text{ V}$$

b) $i_b(t) = 28,28 \cos(800t + 45^\circ) \text{ mA} //$

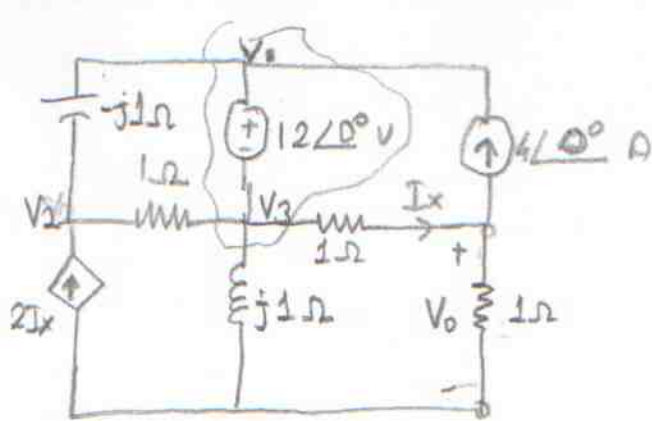
$$i_c(t) = 141,42 \cos(800t + 45^\circ) \text{ mA} //$$

$$v_g(t) = 8,37 \cos(800t + 29,32^\circ) \text{ V} //$$

c)



②.



Dijam perilmten

$$a) \frac{V_1 - V_2}{-j} + \frac{V_3 - V_2}{1} - 4 \angle 0^\circ + \frac{V_3 - V_0}{1} + \frac{V_3}{j1} = 0$$

$$\frac{V_2 - V_1}{-j1} + \frac{V_2 - V_3}{1} - 2 \left(\frac{V_3 - V_0}{1} \right) = 0$$

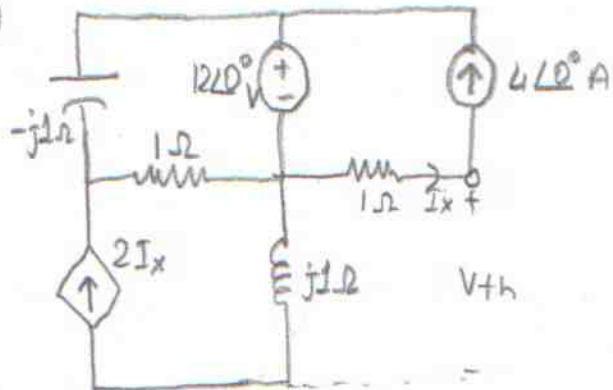
$$4 \angle 0^\circ + \frac{V_0 - V_3}{1} + \frac{V_0}{1} = 0$$

$$3V_0 - (1+j)V_2 = -(4+j12)$$

$$(-4+j12)V_0 + (1+j)V_2 = 12+j16$$

$$V_0 = \frac{-(8+j4)}{1+j2} = 4 \angle 143.13^\circ \text{ V}$$

b)

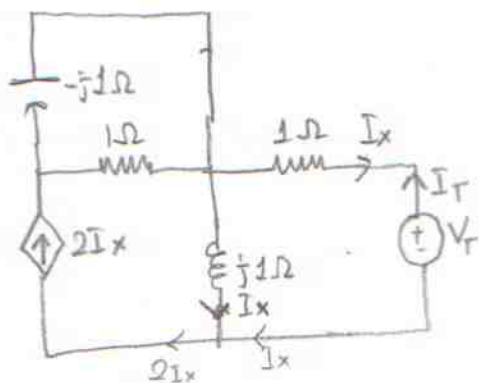


$$I_x = 4 \angle 0^\circ$$

$$V_{th} = j1(2I_x) - I_x \cdot 1$$

$$V_{th} = 8j - 4 = -4 + j8 \text{ V}$$

Thevenin



$$I_T = -I_x$$

$$j1I_x - V_T - 1I_x = 0$$

$$I_T(1-j) = V_T$$

$$\frac{V_T}{I_T} = 2 + 1 = 3 \Omega$$

$$V_0 = \frac{V_{th}}{2+1+1} = \frac{-4+j8}{2-j} = 4 \angle 143.13^\circ \text{ V}$$

