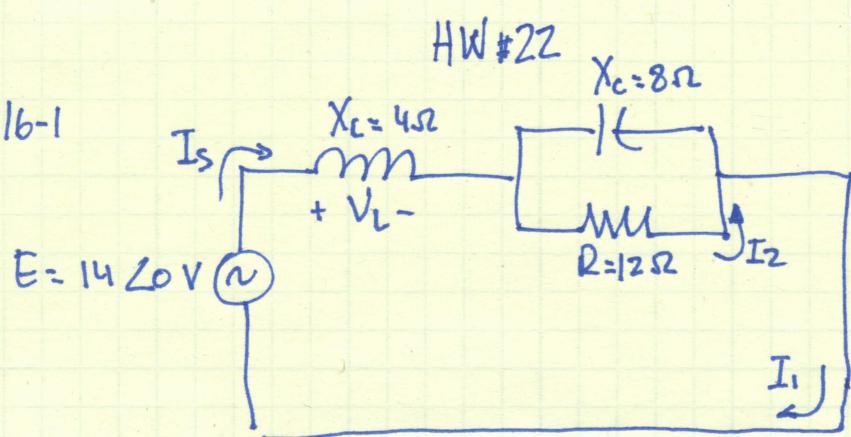


16-1



$$Z_L = 4j = 4 \angle 90^\circ$$

$$Z_C = -8j = 8 \angle -90^\circ$$

$$Z_R = 12 = 12 \angle 0^\circ$$

a.) $Z_T = Z_L + (Z_C \parallel Z_R) = 4j + (-8j \parallel 12) = 3,7 - 1,5j = 4 \angle -22,6^\circ$

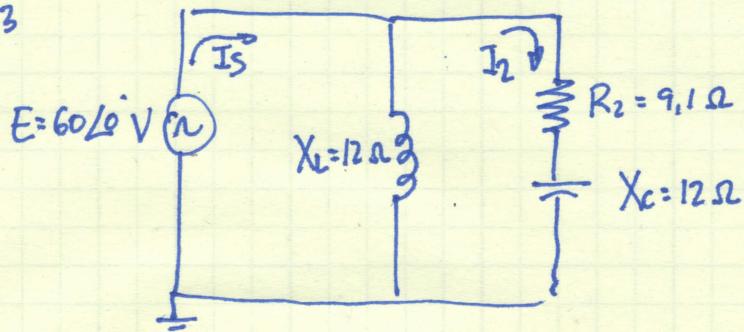
b.) $I_S = \frac{E_S}{Z_T} = \frac{14 \angle 0^\circ V}{4 \angle -22,6^\circ} = 3,5 \angle 22,6^\circ A$

c.) $I_1 = I_S = 3,5 A \angle 22,6^\circ$

d.) $I_2 = I_S \cdot \frac{Z_2}{Z_1 + Z_2} = 3,5 \angle 22,6^\circ \cdot \frac{8 \angle -90^\circ}{12 - 8j} = 1,94 A \angle -33,6^\circ$

e.) $V_L = I_S \cdot Z_L = 3,5 \angle 22,6^\circ \cdot 4 \angle 90^\circ = 14 \angle 112,6^\circ V$

16-3



$$Z_L = 12j = 12 \angle 90^\circ$$

$$Z_R = 9,1 = 9,1 \angle 0^\circ$$

$$Z_C = -12j = 12 \angle -90^\circ$$

a.) $Z_T = Z_L \parallel (Z_R + Z_C) = 12 \angle 90^\circ \parallel (9,1 - 12j) = 19,9 \angle 37,2^\circ \Omega$

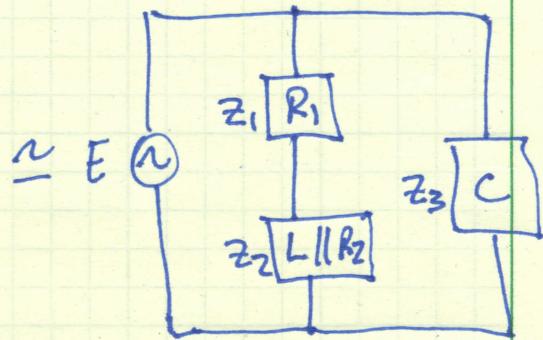
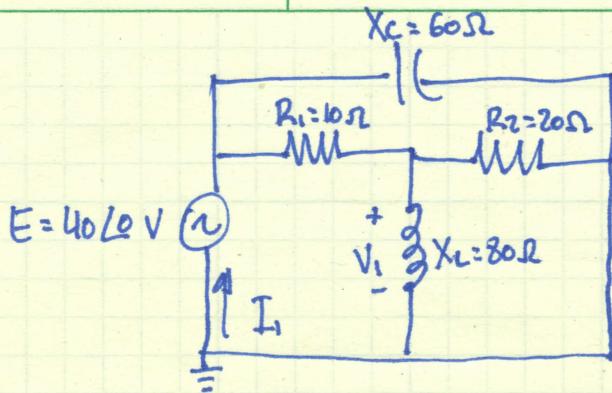
b.) $I_S = \frac{E_S}{Z_T} = \frac{60 \angle 0^\circ V}{19,9 \angle 37,2^\circ \Omega} = 3,02 \angle -37,2^\circ A$

c.) $I_2 = I_S \cdot \frac{Z_2}{Z_1 + Z_2} = 3,02 \angle -37,2^\circ \cdot \frac{12 \angle 90^\circ}{12j + 9,1 - 12j} = 3,98 \angle 52,8^\circ A$

d.) $V_C = E \cdot \frac{Z_C}{Z_R + Z_C} = 60 \angle 0^\circ \cdot \frac{12 \angle 90^\circ}{9,1 - 12j} = 47,8 \angle -37,2^\circ V$

e.) $P = V \cdot I \cos \Phi = 60 V \cdot 3,02 A \cdot \cos 37,2^\circ = 144,4 W$

16-7



$$\text{a.) } I_1 = I_T$$

$$I_T = \frac{E_T}{Z_T} = \frac{40 \angle 0^\circ}{28,1 \angle -18,2^\circ} = 1,42 \angle 18,2^\circ \text{ A}$$

$$Z_T = (Z_1 + Z_2) \parallel Z_3 = (10 \Omega + 19,4 \angle 14^\circ) \parallel 60 \angle 90^\circ = 28,1 \angle -18,2 \Omega$$

$$\boxed{I_T = 1,42 \angle 18,2^\circ \text{ A}}$$

$$\text{b.) } V_1 = E \cdot \frac{Z_2}{Z_2 + Z_1} = 40 \angle 0^\circ \cdot \frac{19,4 \angle 14^\circ}{10 \Omega + 19,4 \angle 14^\circ} = \boxed{26,57 \angle 14,7^\circ \text{ V} = V_1}$$

$$\text{c.) } P = V \cdot I \cos \theta = 40 \text{ V} \cdot 1,42 \text{ A} \cdot \cos 18,2^\circ = \boxed{54,07 \text{ W} = P}$$