

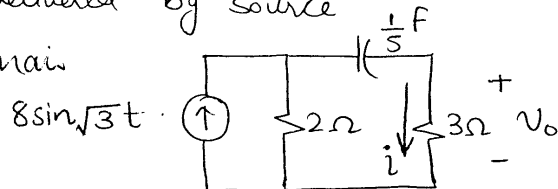
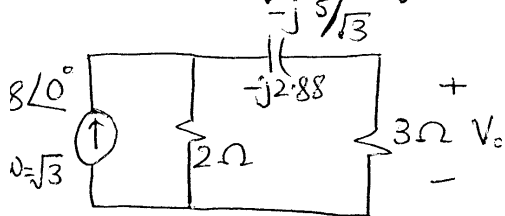
EE 204 Fundamentals of Electric Circuits Quiz 6 Solution (Sample Quiz)

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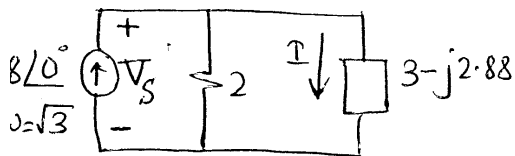
Quiz

- Q. (a) Find $v_o(t)$ and $i(t)$
 (b) Find average power delivered by source

Change to frequency domain



$$v_o(t) = 8.31 \sin(\sqrt{3}t + 30^\circ)$$



Apply current division.

$$I = \frac{2}{2+3-j2.88} \times 8\angle 0^\circ = \frac{2 \times 8\angle 0^\circ}{5\angle -30^\circ}$$

$$= 2.77\angle +30^\circ$$

$$(b) P = \frac{1}{2} V_s I_s \cos \theta$$

$$= \frac{1}{2} \times 11.52 \times 8 \times \cos(\theta_v - \theta_i)$$

$$= \frac{1}{2} \times 11.52 \times 8 \times \cos(-13.83^\circ - 0^\circ)$$

$$P = 44.74 \text{ W}$$

$\therefore V_s$ is the voltage across source which is in parallel with the impedance.

$$V_s = I Z = (2.77\angle +30^\circ)(3-j2.88)$$

$$= (2.77\angle +30^\circ)(4.16\angle -43.83^\circ)$$

$$V_s = 11.52\angle -13.83^\circ$$

This will be used to calculate average power of the source.

$$\text{Now } v_o = (I)(3)$$

$$= (2.77\angle +30^\circ)(3)$$

$$= 8.31\angle +30^\circ$$