

ECE 210 Q10 11/30/00

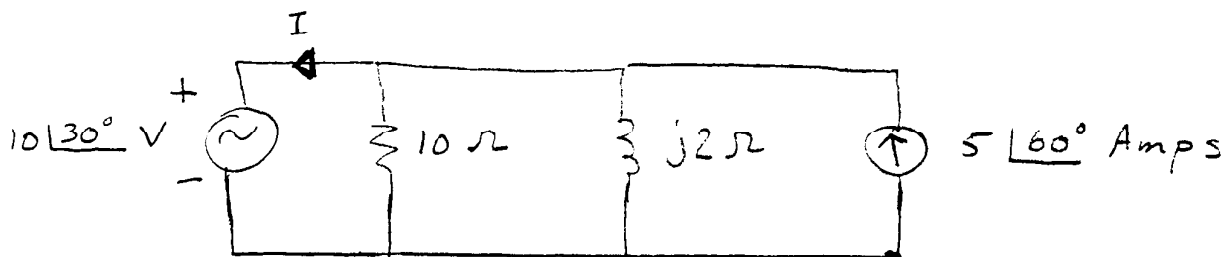
NAME:

Honor Code:

KEY

Find the average power supplied/absorbed by each element in the following circuit.

Hint: You may use $\sum P_{avg} = 0$ to calculate power for one of the elements.



$$10\Omega: P = \frac{1}{2} V_m^2 / R = \frac{1}{2} 10^2 / 10 = \underline{5}$$

$$j2\Omega: \underline{0} \text{ Always!}$$

$$CS: P = \frac{1}{2} I_m V_m \cos(\theta_V - \theta_I) = \frac{1}{2} (-5)(10) \cos(30 - 60) = \underline{-21.65}$$

$$VS: \sum P = 0 \quad P = 21.65 - 5 = \underline{16.65}$$

$$\underline{OR} \quad I = -\frac{10\angle 30}{10} - \frac{10\angle 30}{j2} + 5\angle 60$$

$$= -8.2061 \angle 83.94^\circ$$

$$P = \frac{1}{2} I_m V_m \cos(\theta_V - \theta_I)$$

$$= \frac{1}{2} (-8.2061)(10) \cos(30 + 83.94)$$

$$= \underline{16.65 W}$$

10 V VS	: 16.65 W
10 Ω	: 5 W
j2 Ω	: 0 W
5 A CS	: -21.65 W