

# ECE 311 - Solution to Homework #5

## Complex Power

1) Determine the voltage, current, impedance, and power for the following

$$V = I \cdot Z$$

$$P = V \cdot I^* = \frac{|V|^2}{Z^*} = |I|^2 Z$$

	Voltage	Current	Impedance	Power
a)	10 + j20	30 + j40	<b>0.440+j0.080</b>	<b>1100 + j200</b>
b)	10 + j20	<b>0.5 + j0.167</b>	30 + j30	<b>8.333 + j8.333</b>
c)	10 + j20	<b>2.200 + j0.400</b>	<b>6.00 + j8.00</b>	30 + j40
d)	<b>33.437</b>	<b>0.897 - j1.196</b>	10 + j20	30 + j40

*note: For part d), the phase for the voltage is arbitrary. Assuming a voltage reference makes it pure real.*

2) Determine the voltage, current, impedance, and power for the following

	Voltage	Current	Impedance	Power
a)	10∠20°	30∠40°	0.333∠-20°	300∠-20°
b)	10∠20°	0.333∠-20°	30∠40°	3.33∠40°
c)	10∠20°	3∠-20°	3.33∠40°	30∠40°
d)	17.32∠0°	1.732∠-20°	10∠20°	30∠40°

*note: For part d), the phase for the voltage is arbitrary. Assuming a voltage reference makes it pure real.*