AC Ohms Law Examples (38:03)

Given the following information solve for the desired property. Draw phasors on a phasor diagram.

① $\bar{V} = 24V\angle 0°$
$\bar{Z} = 120\Omega\angle 90°$
$\bar{I} =$

② $\bar{I} = 400mA\angle 0°$
$\bar{Z} = 150\Omega\angle 0°$
$\bar{V} =$

③ $\bar{V} = 32V\angle 0°$
$\bar{I} = 80mA\angle 90°$
$\bar{Z} =$

Determine the relative phase shift of current with respect to voltage for the previous set of example problems.

Given the following information solve for the desired property. Draw phasors on a phasor diagram.

① $\bar{I} = 120mA\angle -25°$
$\bar{Z} = 240\Omega\angle 0°$
$\bar{V} =$

② $\bar{V} = 56V\angle 30°$
$\bar{I} = 180mA\angle 120°$
$\bar{Z} =$

③ $\bar{V} = 80V\angle 90°$
$\bar{Z} = 40\Omega\angle 90°$
$\bar{I} =$

Determine the relative phase shift of current with respect to voltage for the previous set of example problems.

Given the following information solve for the desired property. Draw phasors on a phasor diagram.

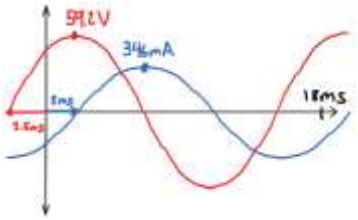
① $\bar{V} = 120V\angle 0°$
$\bar{I} = 1.3A\angle -30°$
$\bar{Z} =$

② $\bar{V} = 96V\angle 20°$
$\bar{Z} = 190\Omega\angle -35°$
$\bar{I} =$

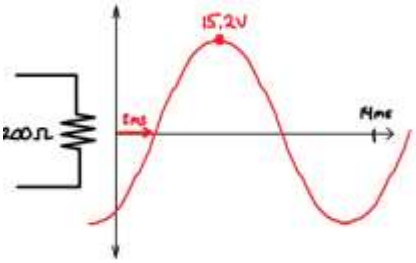
③ $\bar{I} = 86mA\angle -10°$
$\bar{Z} = 200\Omega\angle 50°$
$\bar{V} =$

Determine the relative phase shift of current with respect to voltage for the previous set of example problems.

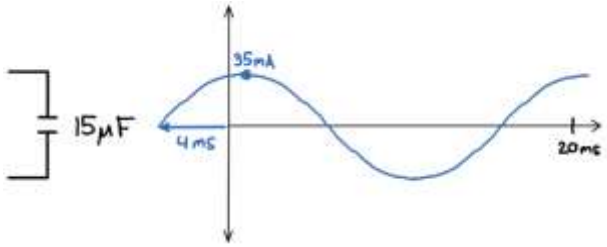
Given the following information solve for the impedance. Draw phasors on a phasor diagram. Determine the relative phase shift of current with respect to voltage.



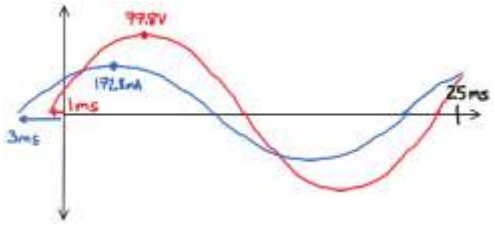
Given the following information solve for current. Draw phasors on a phasor diagram. Determine the relative phase shift of current with respect to voltage.



Given the following information solve for voltage. Draw phasors on a phasor diagram. Determine the relative phase shift of current with respect to voltage.



Given the following information solve for the impedance and the components that comprise this impedance. Draw phasors on a phasor diagram. Determine the relative phase shift of current with respect to voltage.



Given the coil of a contactor modeled as:
1) a 10Ω resistance in series with a 10mH inductor when initially energized and the contact carrier is not pulled into the coil
2) a 10Ω resistance in series with a 1.5H inductor when the contact carrier is fully pulled into the coil
Explain why the coil burns out if the coil is energized by 120V, 60Hz AC but an obstruction prevents the plunger from being pulled into the coil.

Explain why the above coil, rated for 120V, 60Hz AC, burns out when energized by 24V DC.

Explain why motor drives commonly use V/Hz control where, as frequency is increased, voltage is also increased. As a practical example, consider a motor winding modeled as a 110 resistor in series with a 170mH inductor. Assume the motor enters overload conditions if current is above 1.75A. Consider two operating points: 208V at 60Hz and 104V at 30Hz