Introduction to Phasors 2:
The Method

Step 1

Adopt Cosine Reference
(Time Domain)

$v_s(t) = 12 \sin(\omega t - 45°)$
(V)
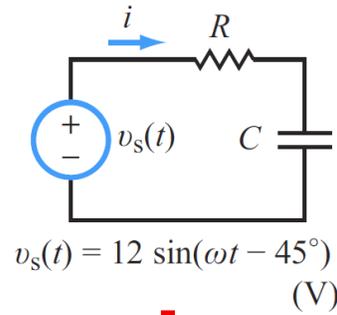
Step 2

Transfer to Phasor Domain

$i \longrightarrow \mathbf{I}$
$v \longrightarrow \mathbf{V}$
$R \longrightarrow \mathbf{Z_R} = R$
$L \longrightarrow \mathbf{Z_L} = j\omega L$
$C \longrightarrow \mathbf{Z_C} = 1/j\omega C$

$\mathbf{V_s} = 12e^{-j135°}$ (V)
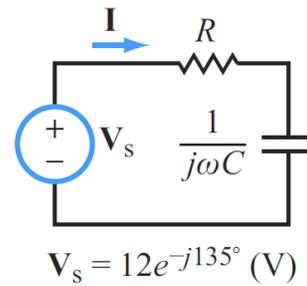
Step 3

Cast Equations in
Phasor Form

$$\mathbf{I}\left(R + \frac{1}{j\omega C}\right) = \mathbf{V_s}$$

Step 4

Solve for Unknown Variable
(Phasor Domain)

$$\mathbf{I} = \frac{\mathbf{V_s}}{R + \dfrac{1}{j\omega C}}$$

Step 5

Transform Solution
Back to Time Domain

$i(t) = \Re\mathfrak{e}[\mathbf{I}e^{j\omega t}]$
$= 6 \cos(\omega t - 105°)$
(mA)