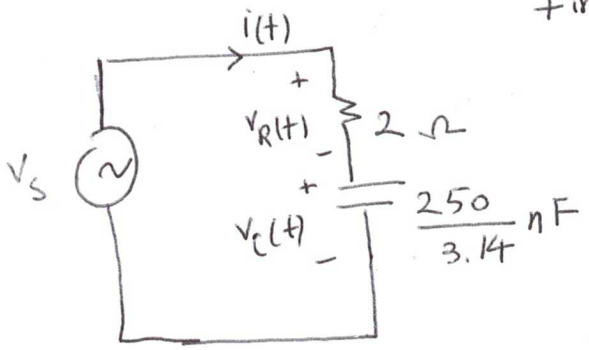

find $i(t)$, $V_C(t)$, $V_R(t)$ if

$V_S = 3\cos(\omega t + 45^\circ)$?

$f = 2\,MHz \rightarrow \omega = 2\pi \times 2 \times 10^6$

$$Z_C = \frac{1}{j\omega C} = \frac{1}{j \times 2\pi \times 2 \times 10^6 \times \frac{250}{3.14} \times 10^{-9}}$$

$$Z_C = \frac{1}{j \times 10^3 \times 10^6 \times 10^{-9}} = -j\,\Omega = 1\angle -90^\circ$$

$V_S(t) = 3\cos(\omega t + 45^\circ)$

$\rightarrow$ Phasor $V_S = 3\angle 45^\circ = 3e^{j\,\pi/4}$

$$Z_{eq} = 2 + Z_C = 2 - j = \sqrt{5}\angle -26.56^\circ = 2.24\angle -26.56^\circ$$

$$I = \frac{V_S}{Z_{eq}} = \frac{3\angle 45^\circ}{2.24\angle -26.56^\circ} = 1.34\angle 71.56^\circ\ A$$

$\rightarrow i(t) = Re[I e^{j\omega t}] = 1.34\cos(\omega t + 71.56^\circ)$

$$V_C = I \times Z_C = 1.34\angle 71.56^\circ \times 1\angle -90^\circ = 1.34\angle -18.44^\circ$$

$$V_C(t) = Re[V_C \cdot e^{j\omega t}] = 1.34\cos(\omega t - 18.44^\circ)$$

$$V_R = I \times Z_R = 1.34\angle 71.56^\circ \times 2 = 2.68\angle 71.56^\circ$$

$$V_R(t) = Re[V_R \cdot e^{j\omega t}] = 2.68\cos(\omega t + 71.56^\circ)$$