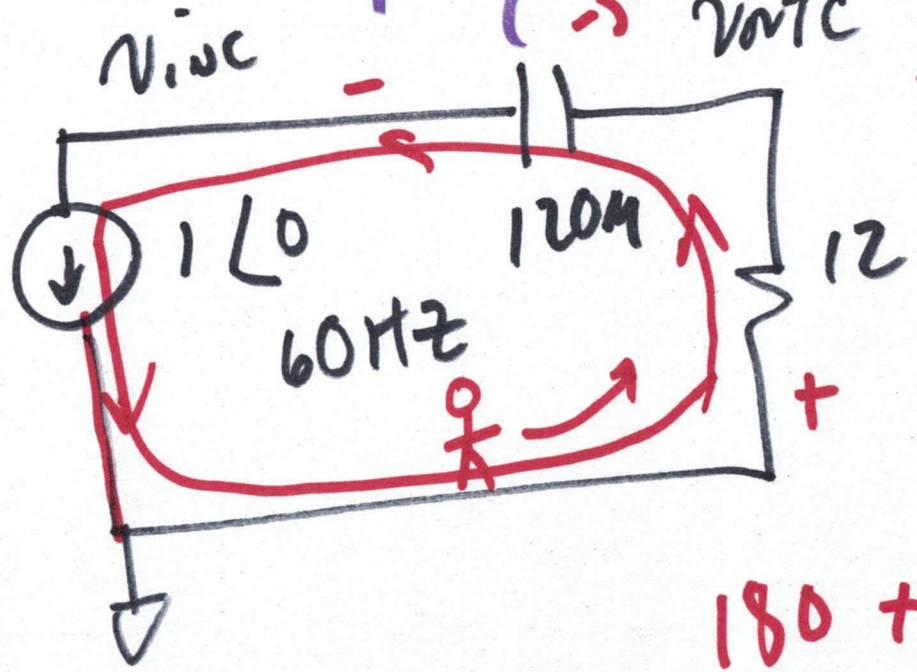
EE 221 Circuits II

Lecture 7

2/10/21



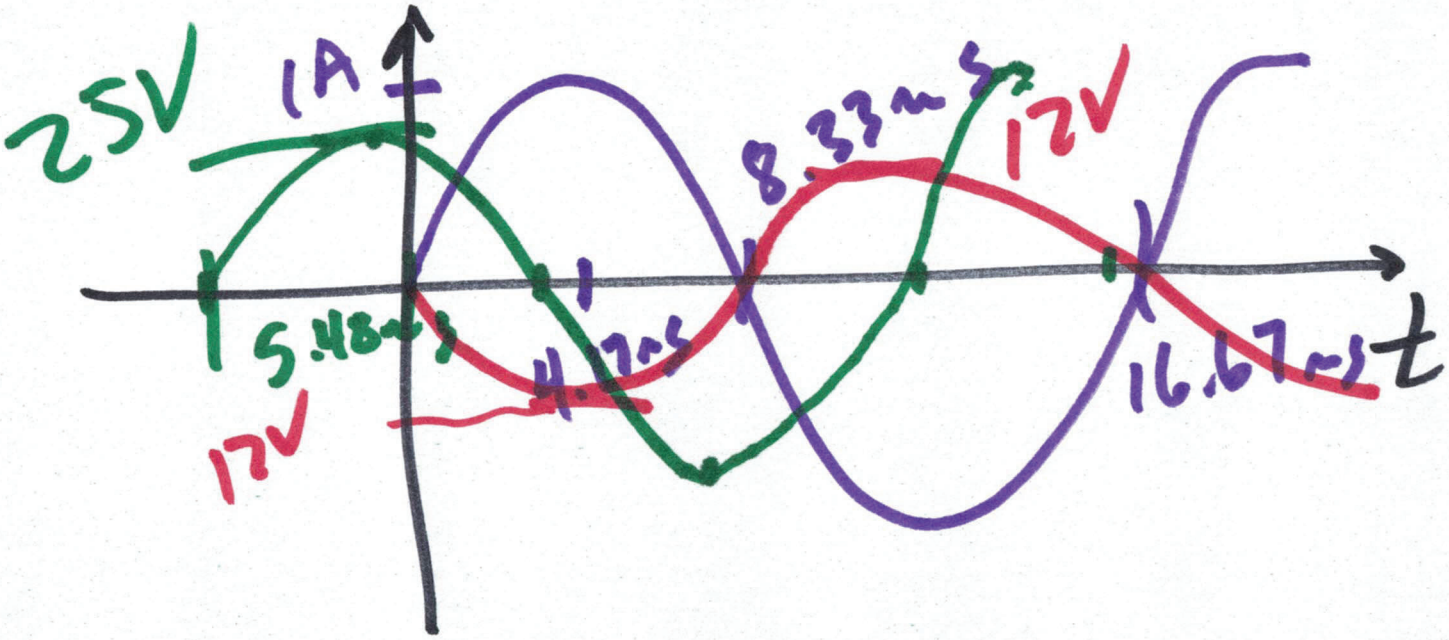
$$V_{INC} = \ominus\left(12 + (-j22.1)\right) \cdot 1\angle 0$$

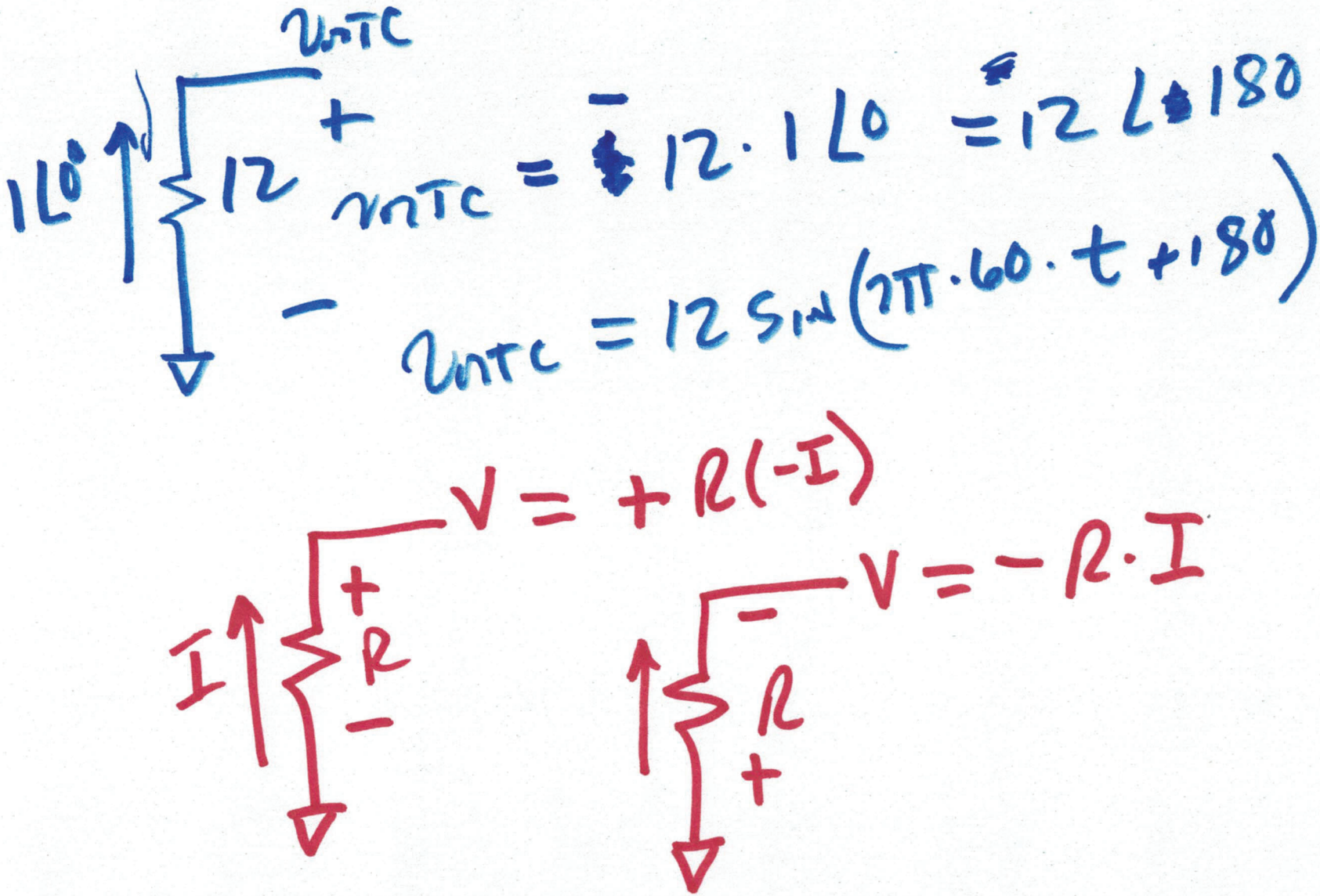
$$V_{INC} = 25\angle 118.5$$

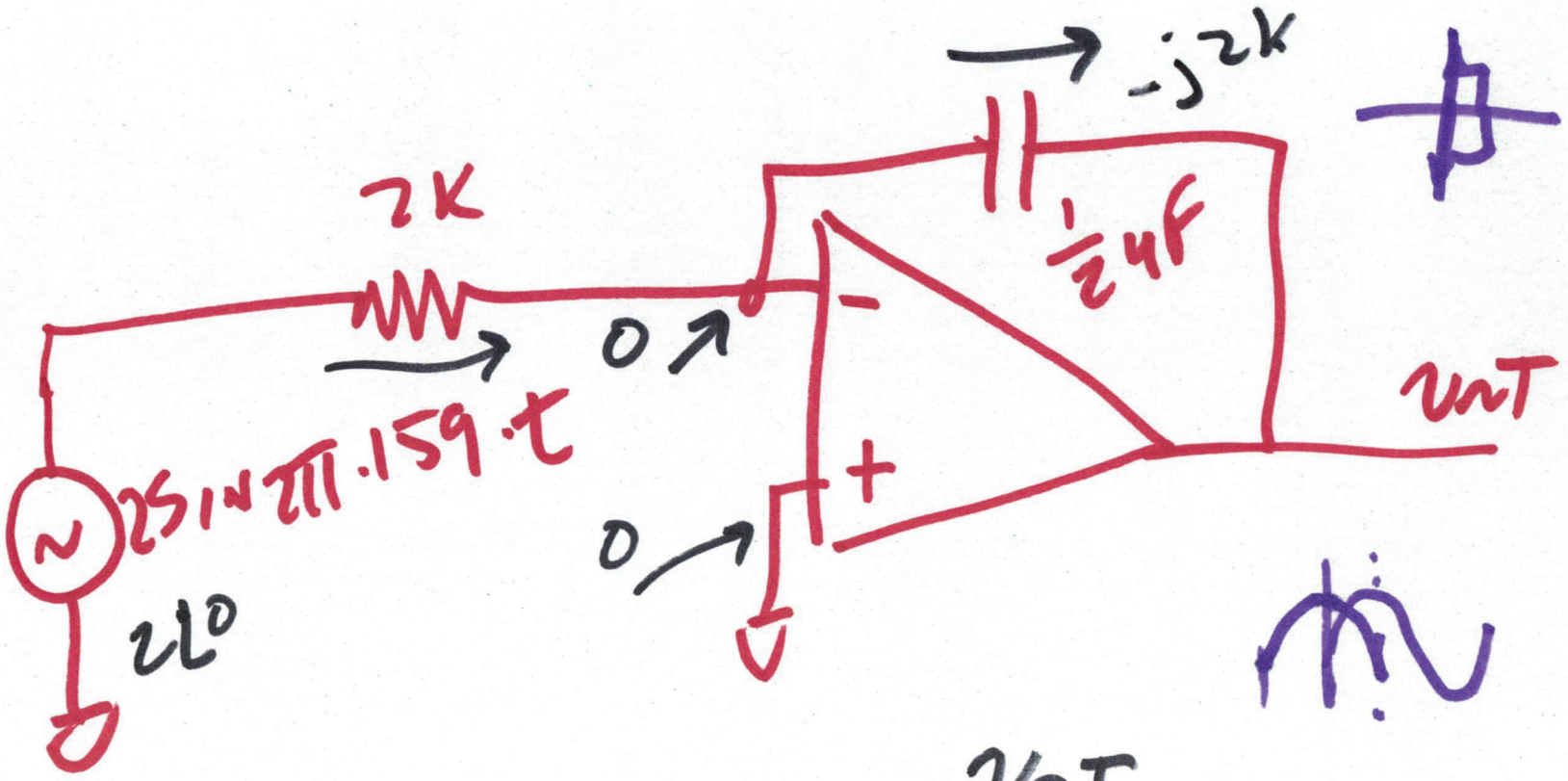
$$180 + \tan^{-1}\frac{-22.1}{12} = -61.5$$

$$v_{INC} = 25 \sin(2\pi \cdot 60 \cdot t + 118.5)$$

$$118.5 = \frac{\Delta t}{16.67\,ms} \cdot 360 \rightarrow \Delta t = 5.48\,ms$$



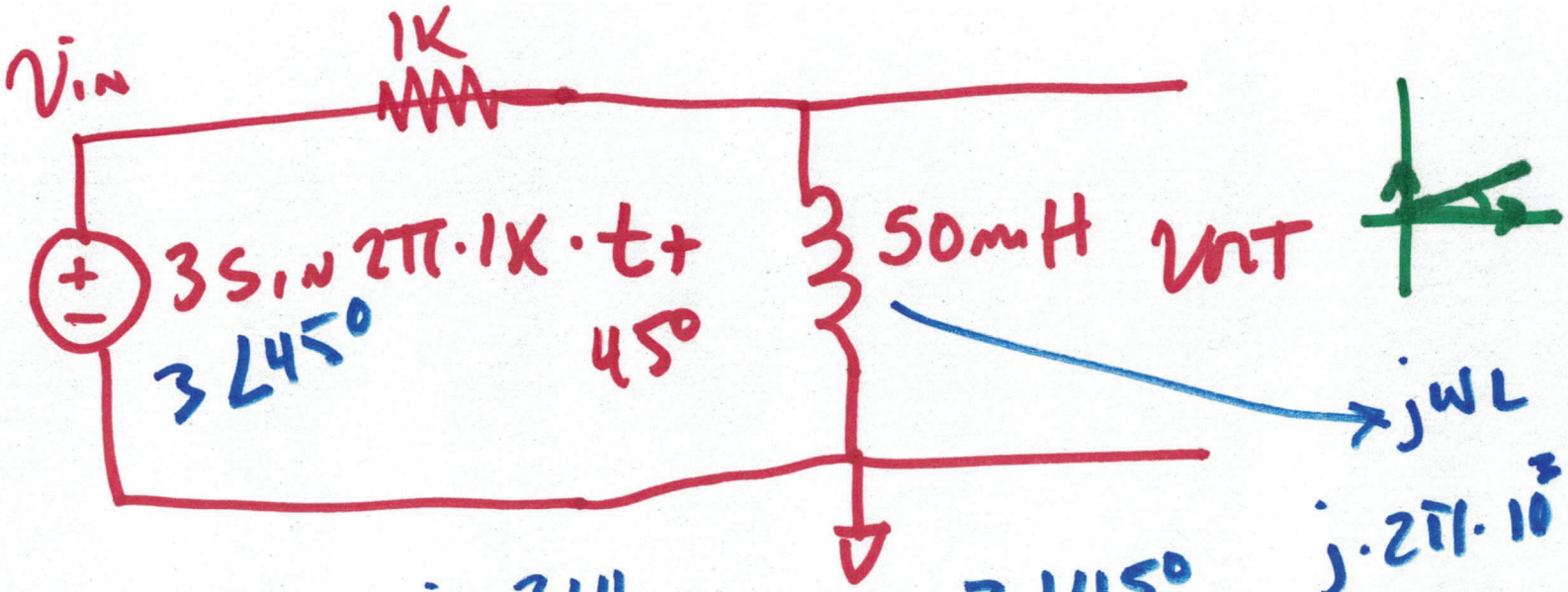

v_{nTC}
+
1∠0°
12
−
$v_{nTC} = -12 \cdot 1\angle 0 = 12\angle 180$
$v_{nTC} = 12\sin(2\pi \cdot 60 \cdot t + 180)$
$V = +R(-I)$
+
I
R
−
$V = -R \cdot I$
−
R
+



$$\frac{2\angle 0}{2k} = \frac{0 - v_{OUT}}{2k\angle -90^\circ}$$

$$2\angle -90 = -v_{OUT}$$

$$v_{OUT} = 2\angle 90$$



$$V_{out} = \frac{j.314}{j.314 + 1000} \cdot 3\angle 45°$$

$$= \frac{314\angle 90 \cdot 3\angle 45°}{1048\angle 17.43°} = .9\angle 117.6$$

$$L = 90 + 45 - 17.43$$

5)

$$v_{IN} = 3\sin(2\pi \cdot 1KHz \cdot t + 45^\circ)$$

$$v_{OUT} = 900mV \cdot \sin(2\pi \cdot 1KHz \cdot t + 117.6)$$

$$45 = \frac{\Delta t}{1ms} \cdot 360$$

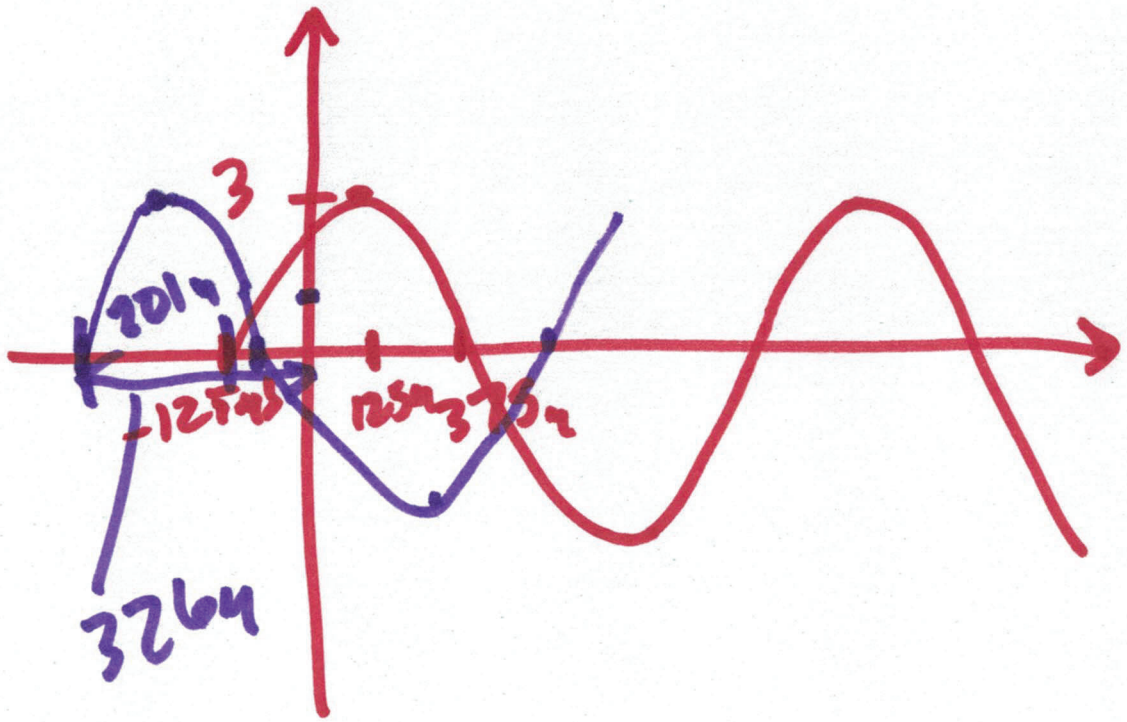
$f = 1kHz$

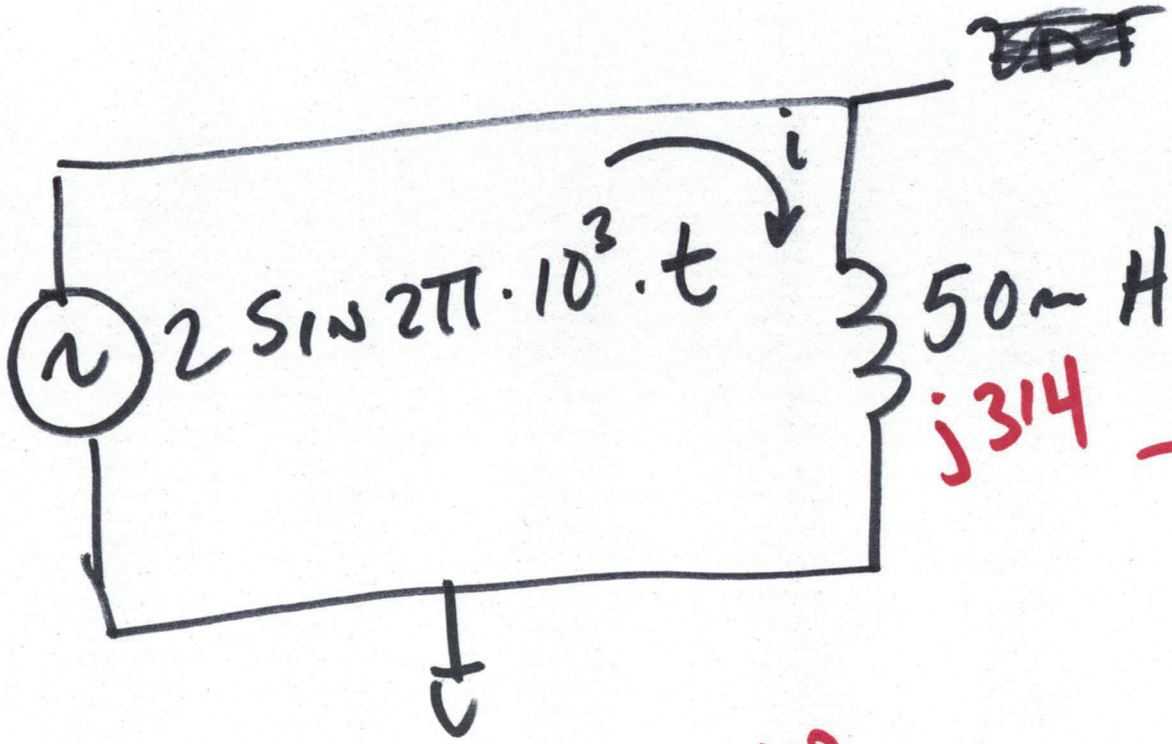
$T = 1ms$

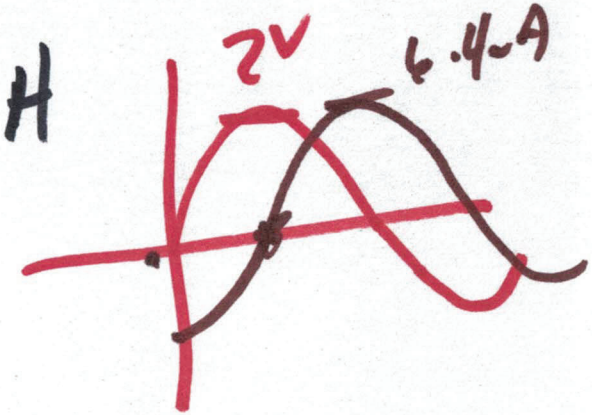
$$\frac{\Delta t}{1ms} = \frac{45}{360} = \frac{1}{8} \rightarrow \Delta t = 125\mu s$$

$$117.6 = \frac{\Delta t}{1ms} \cdot 360 \quad \Delta t = 326\mu s$$

CMOSedu.com


3
-125π/3
125π/3
75π
3264





$$\dot{I} = \frac{2\angle 0}{j314} = 6.4\text{mA}\angle -90^\circ$$

$$i(t) = 6.4\text{mA}\,\sin(2\pi\cdot 10^3\cdot t - 90)$$