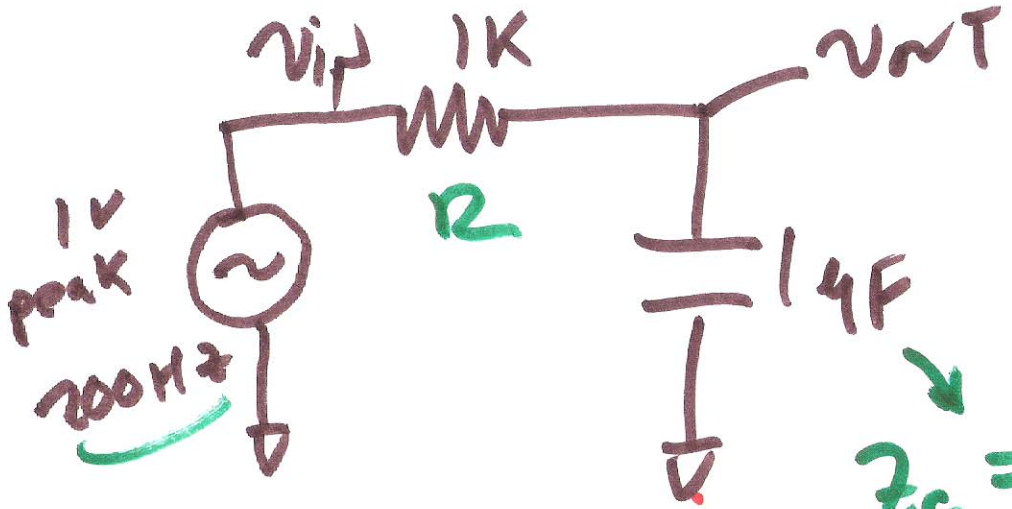
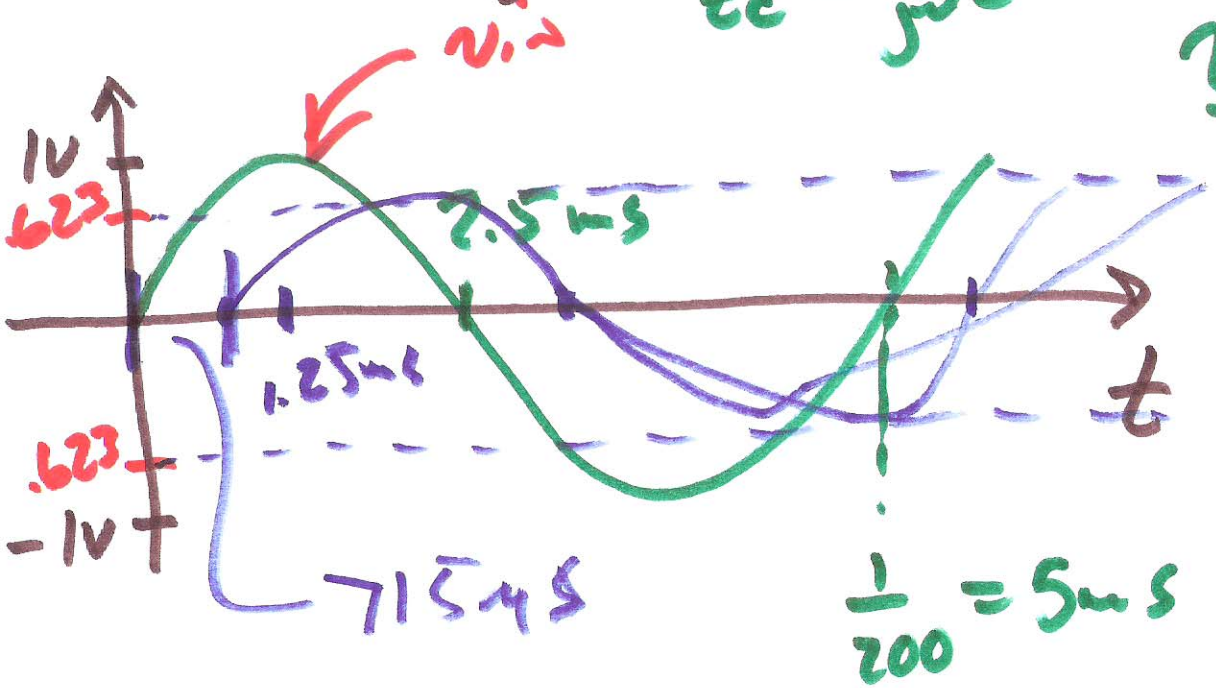


$$V_{out} = V_{in} \cdot \frac{\frac{1}{j\omega C}}{\frac{1}{j\omega C} + R}$$

$$Z_C = \frac{1}{j\omega C}$$

$$\frac{V_{out}}{V_{in}} = \frac{1}{1 + j\omega RC}$$



$$\omega = 2\pi \cdot 200$$

$$f = 200$$

1)

$$\left|\frac{V_{out}}{V_{in}}\right| = \left|\frac{1+j0}{1+j\cdot 2\pi\cdot 200\cdot 10^{3}\cdot 10^{-6}}\right|$$

$$= \left|\frac{1+j0}{1+j\cdot \underbrace{2\pi\cdot\cdot 2}_{1.256}}\right| = \left|\frac{1+j0}{1+j\cdot 1.256}\right|$$

$$\left|\frac{V_{out}}{V_{in}}\right| = \frac{\sqrt{1^2+0^2}}{\sqrt{1+(1.256)^2}} = \frac{1}{1.6} = \underline{\underline{.623}}$$

2)

$$\frac{V_{out}}{V_{in}} = \frac{1 + j0}{1 + j \cdot 1.256}$$

$$\angle \frac{V_{out}}{V_{in}} = \tan^{-1}\frac{0}{1} - \tan^{-1}\frac{1.256}{1}$$

$$\angle \frac{V_{out}}{V_{in}} = -.898 \text{ RADIANS}$$

$$\theta = 51.5^\circ = \frac{t_d}{T} \cdot 360 \qquad \cdot \frac{360}{2\pi}$$

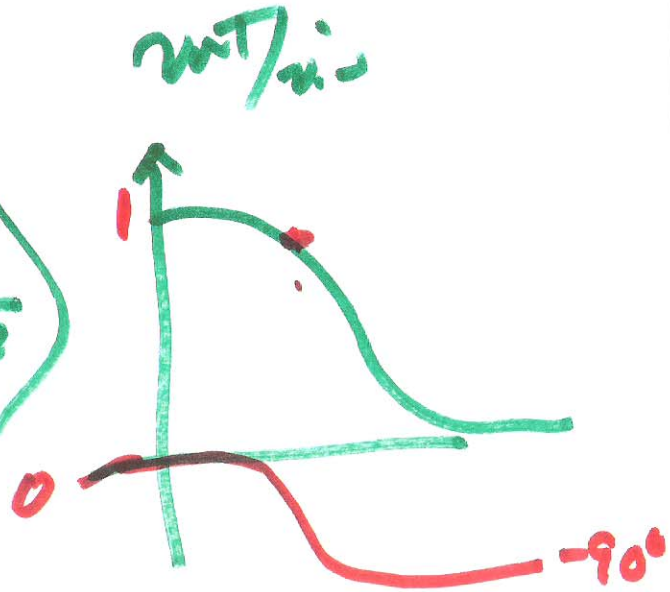
$$= 51.5^\circ$$

$T = 5\text{ms}$

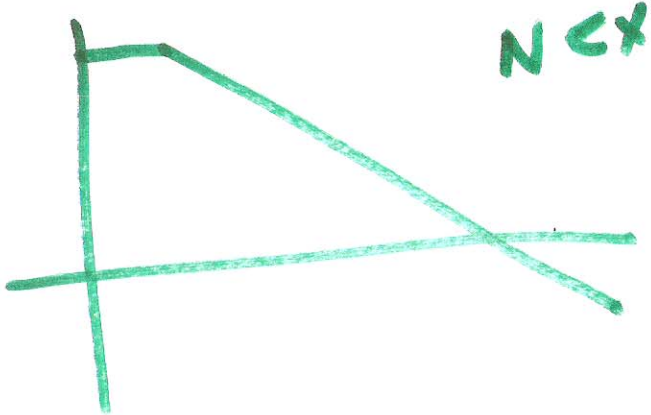
$$t_d = 5\text{ms} \cdot \frac{51.5}{360} = 715\,\mu\text{s}$$

$$\frac{v_{out}}{v_{in}} = \frac{1}{1 + j \cdot 2\pi f RC}$$

$$20 \log \left| \frac{v_{out}}{v_{in}} \right| = 20 \log \left(\frac{1}{\sqrt{1 + (2\pi f RC)^2}} \right)$$



$$\angle \frac{v_{out}}{v_{in}} = -\tan^{-1} 2\pi f RC$$



Next lecture!

4)