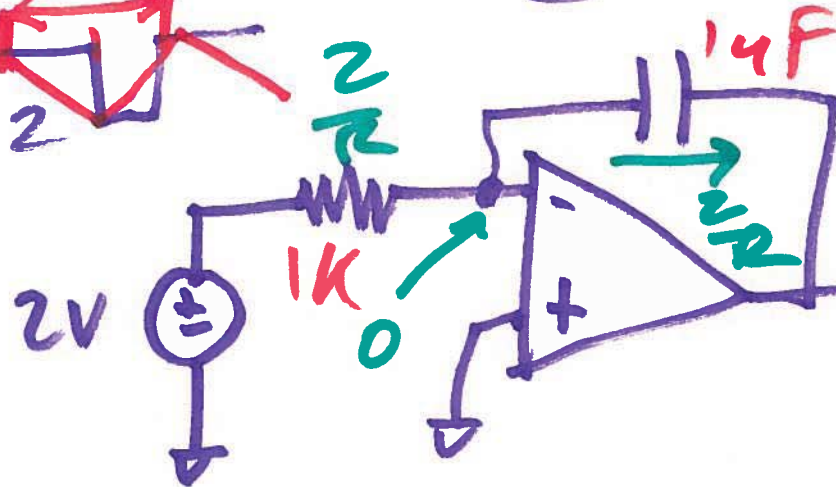
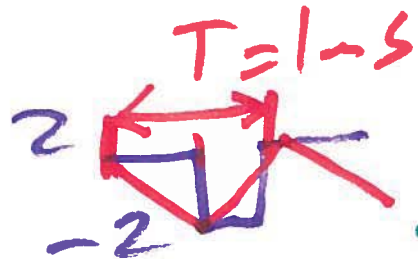


EE 220

Circuits 1

Lecture 24 $i = C \cdot \frac{dv}{dt}$



$$v_o = -\frac{1}{C} \int i \cdot dt$$

$$= -\frac{1}{C} \int_0^{T/2} \frac{2}{R} \cdot dt$$

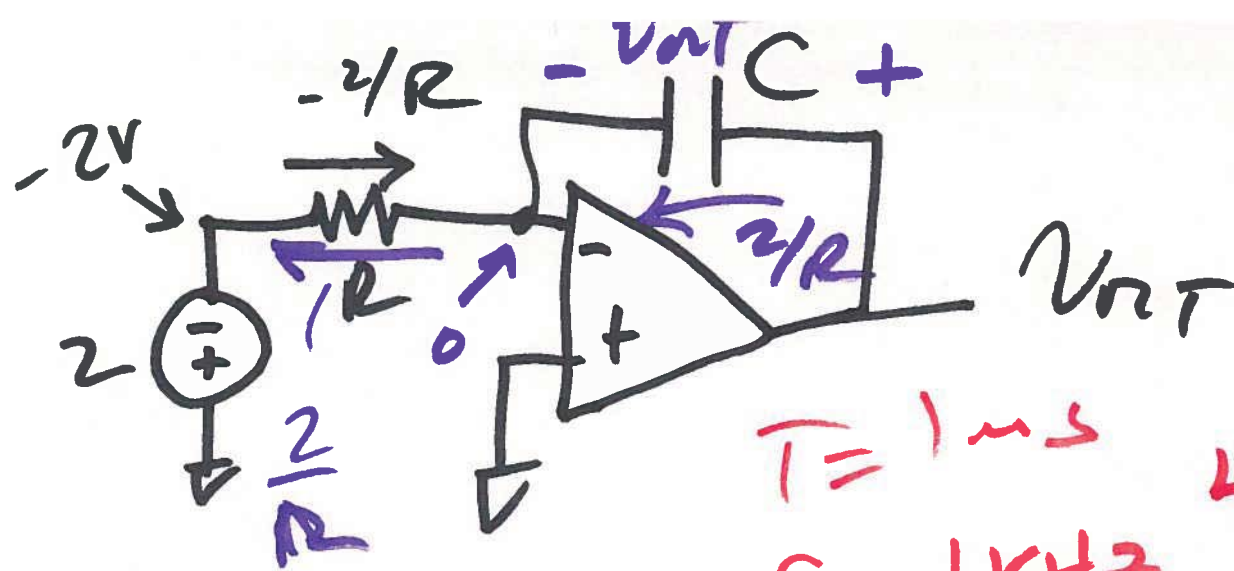
$$= -\frac{1}{RC} \cdot 2 \cdot \left(\frac{T}{2} - 0\right)$$

$$\int k \cdot dt = kt$$

$$-2 = -\frac{2}{RC} \cdot T$$

$\rightarrow T = 1\text{ms}$

1)



$$V(t) = \frac{1}{C} \int_0^{T/2} \frac{2}{R} \cdot dt$$

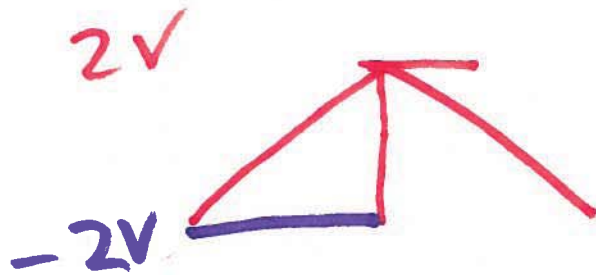
$$T = 1\text{ms}$$

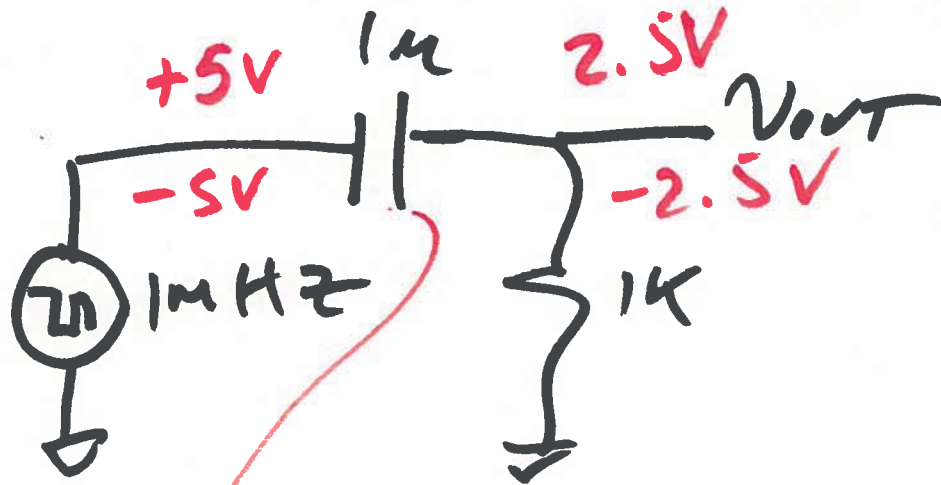
$$f = 1\text{kHz}$$

$$4V = \frac{2}{RC} \cdot \frac{1}{2}\text{ms}$$

$$4V = \frac{1\text{ms}}{RC}$$

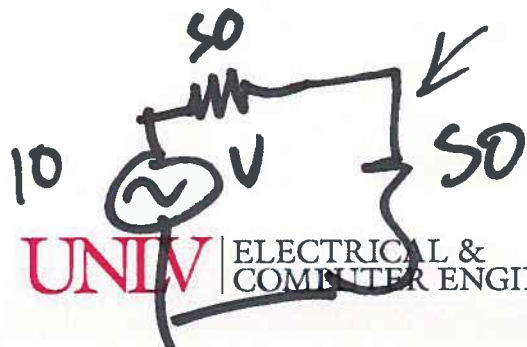
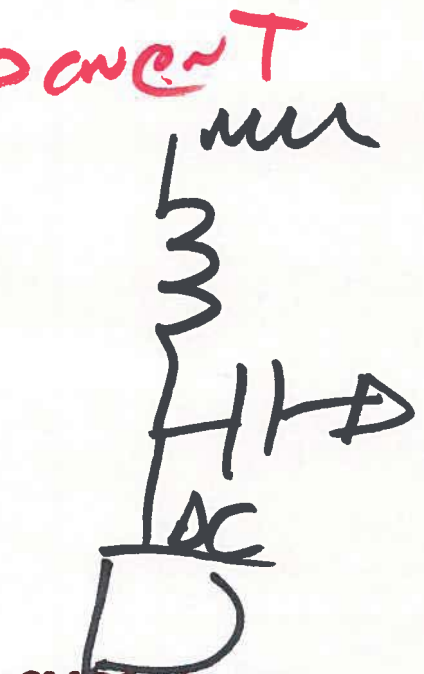
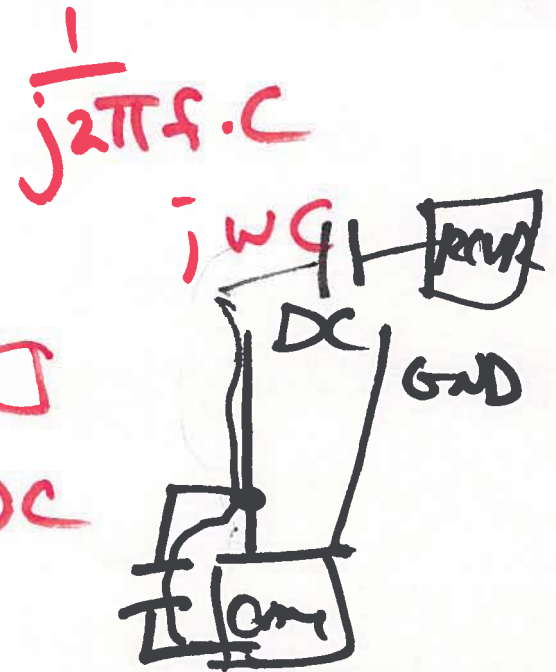
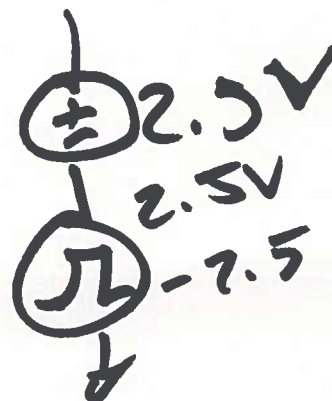
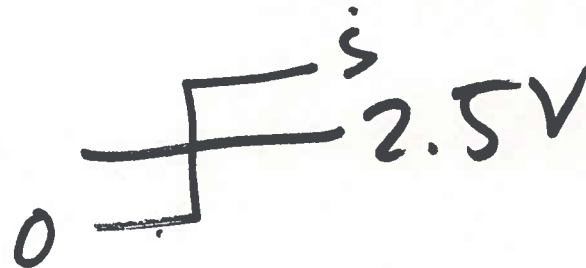
$$RC = 0.25\text{ms}$$



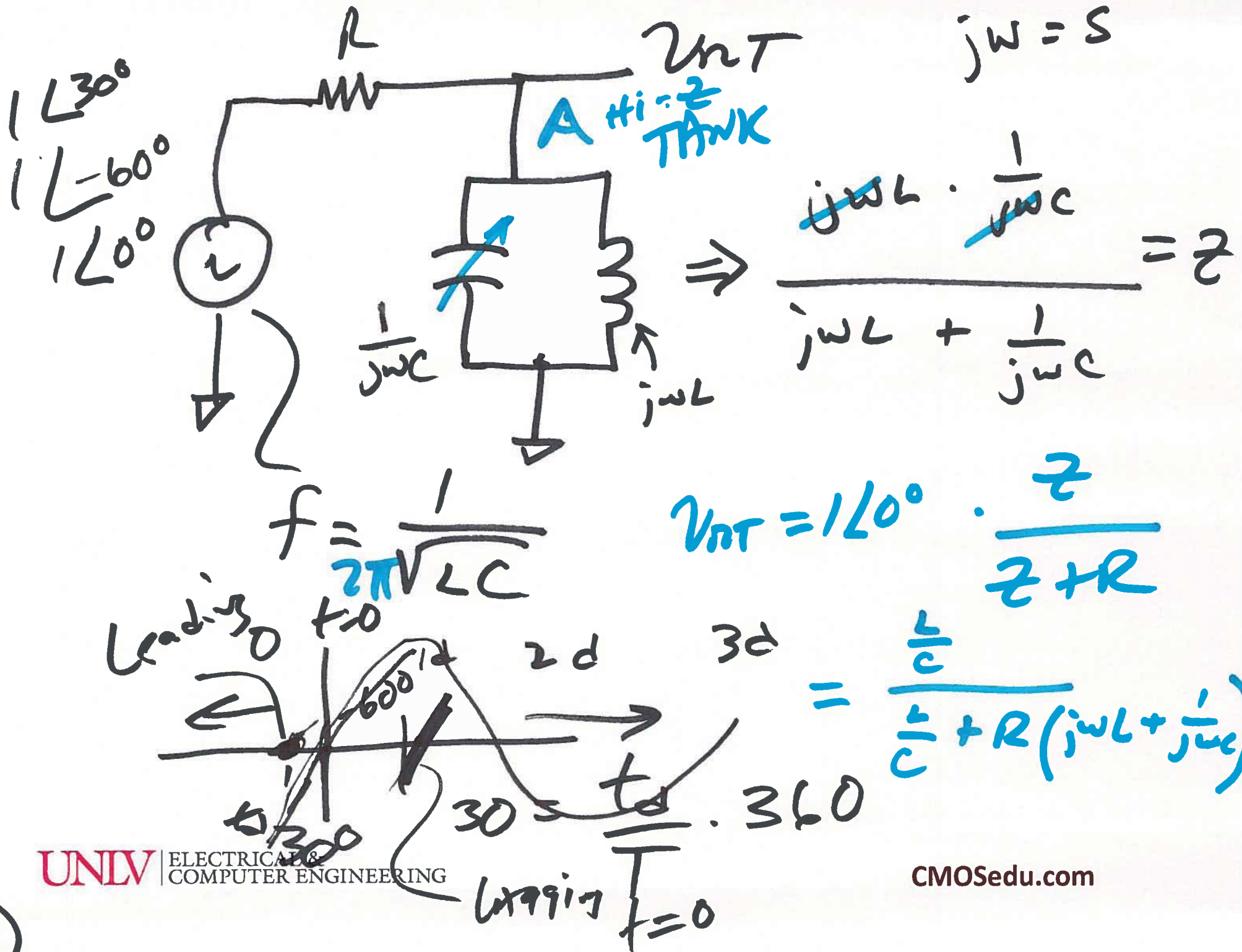


$$RC = 1 - s$$

Removes the DC component



3)



$$f = \frac{1}{2\pi\sqrt{LC}}$$

$$\frac{1}{a} = a$$

$$V_{out} = 1\angle 0^\circ \cdot \frac{\frac{L}{C}}{\frac{L}{C} + R(j\omega L + \frac{1}{j\omega C})}$$

$$\frac{-1}{A} = \frac{-1}{A} =$$

$$= \frac{1}{-A} = -\frac{1}{A}$$

$$1\angle 0^\circ \cdot \frac{L}{C}$$

$$\frac{\frac{L}{C} + R\left(\frac{j2\pi L}{2\pi\sqrt{LC}} + j\frac{(-\sqrt{LC})}{2\pi C}\right)}{}$$

$$= 1\angle 0^\circ \cdot 1$$

$$\frac{1 + R\left(\frac{j2\pi L}{\sqrt{L}} - j\frac{\sqrt{L}}{2\pi C}\right)}{}$$

$$V_{out} = 1\angle 0^\circ$$

5)

Transformer

