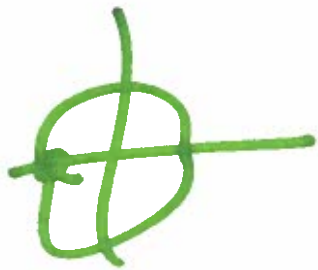


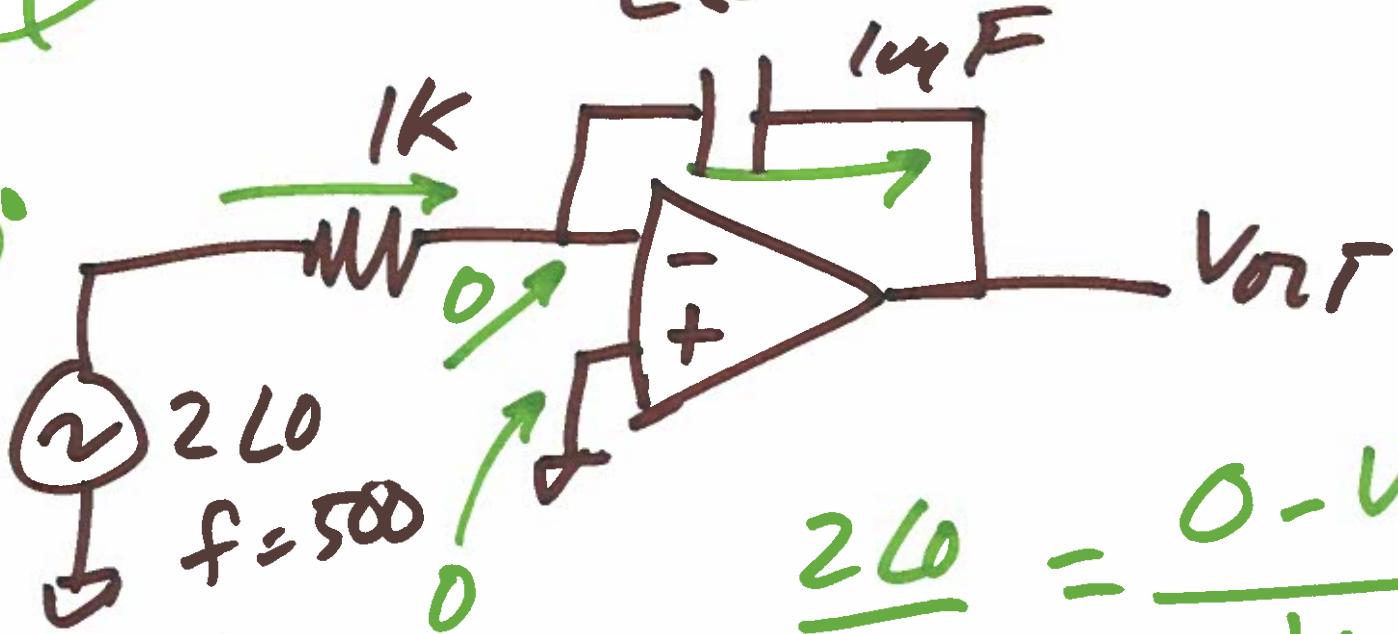
EE 220 Circuits 2

Nov. 27, 2019

Lecture 25 $\frac{1}{j} = -j$



$V_{out} \angle -180^\circ$
 $V_{in} \angle 180^\circ$
 \parallel

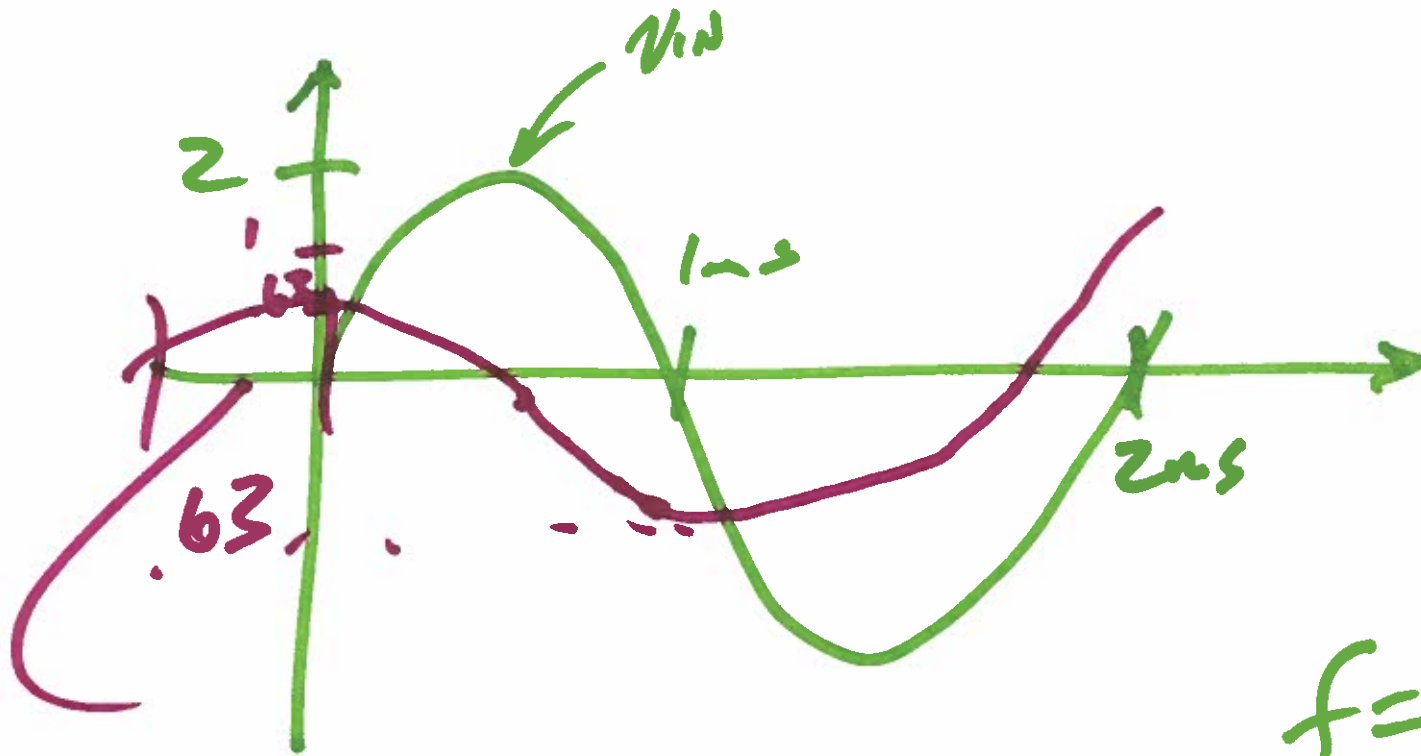


$$-V_{out} = \frac{2 \cdot 318 \angle 270}{0.636 \angle 90}$$

$$\frac{2 \angle 0}{1k} = \frac{0 - V_{out}}{\frac{1}{j \cdot 2\pi \cdot 500 \cdot 1\mu F}}$$

$$= \frac{1}{2\pi \cdot 500 \cdot 1\mu} \angle -90$$

1)

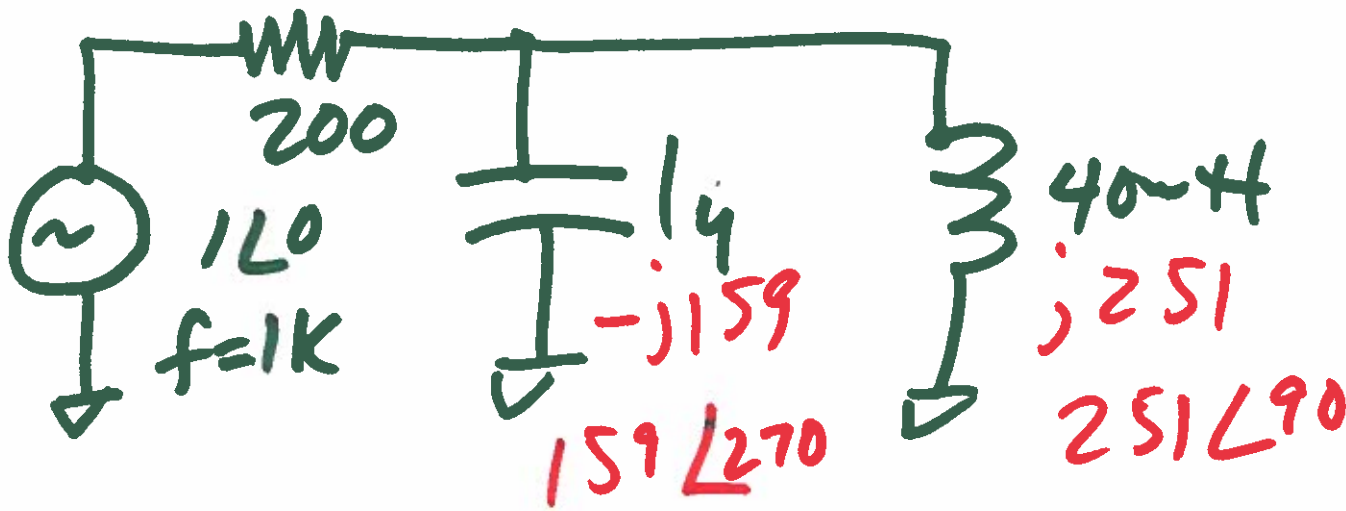


$$t_d = 500 \text{ ns}$$

$$f = 500 \text{ kHz}$$

$$v_{out} = 636 \text{ mV} \sin(2\pi \cdot 500 \cdot t + 90^\circ)$$

2)

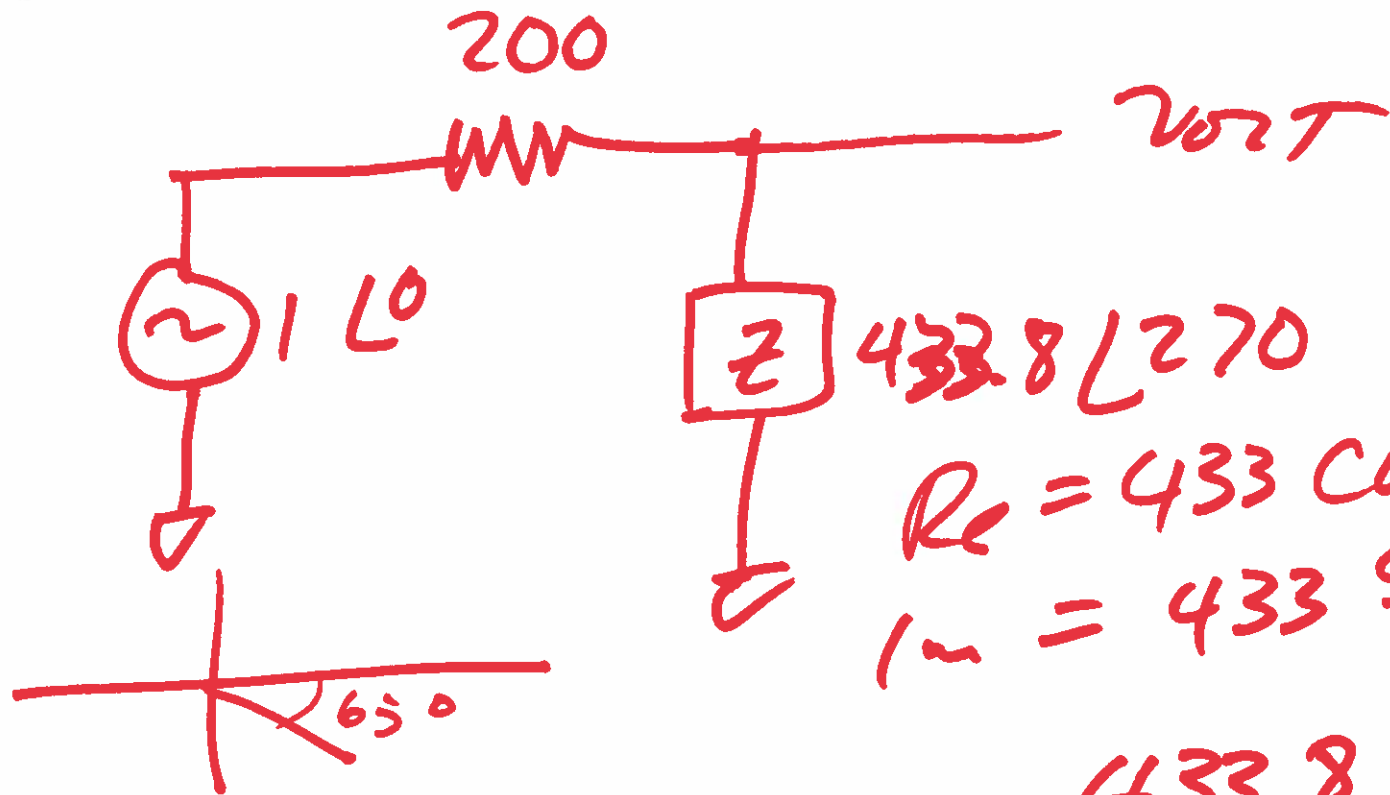


$$\frac{\angle \theta_1}{\angle \theta_2} = \angle \theta_1 - \theta_2$$

$$\frac{159 \angle 270^\circ \cdot 251 \angle 90^\circ}{j(251 - 159)} = \frac{433.8}{92 \angle 90^\circ} = \frac{433.8}{92} \angle 270^\circ$$

$$433.8 \angle 270^\circ$$

3)



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

$$200 + j(-433)$$

$$| \quad | = 477$$

$$\angle = -65^\circ$$

$$\frac{433.8 \angle 270^\circ}{200 + 433 \angle 270^\circ}$$

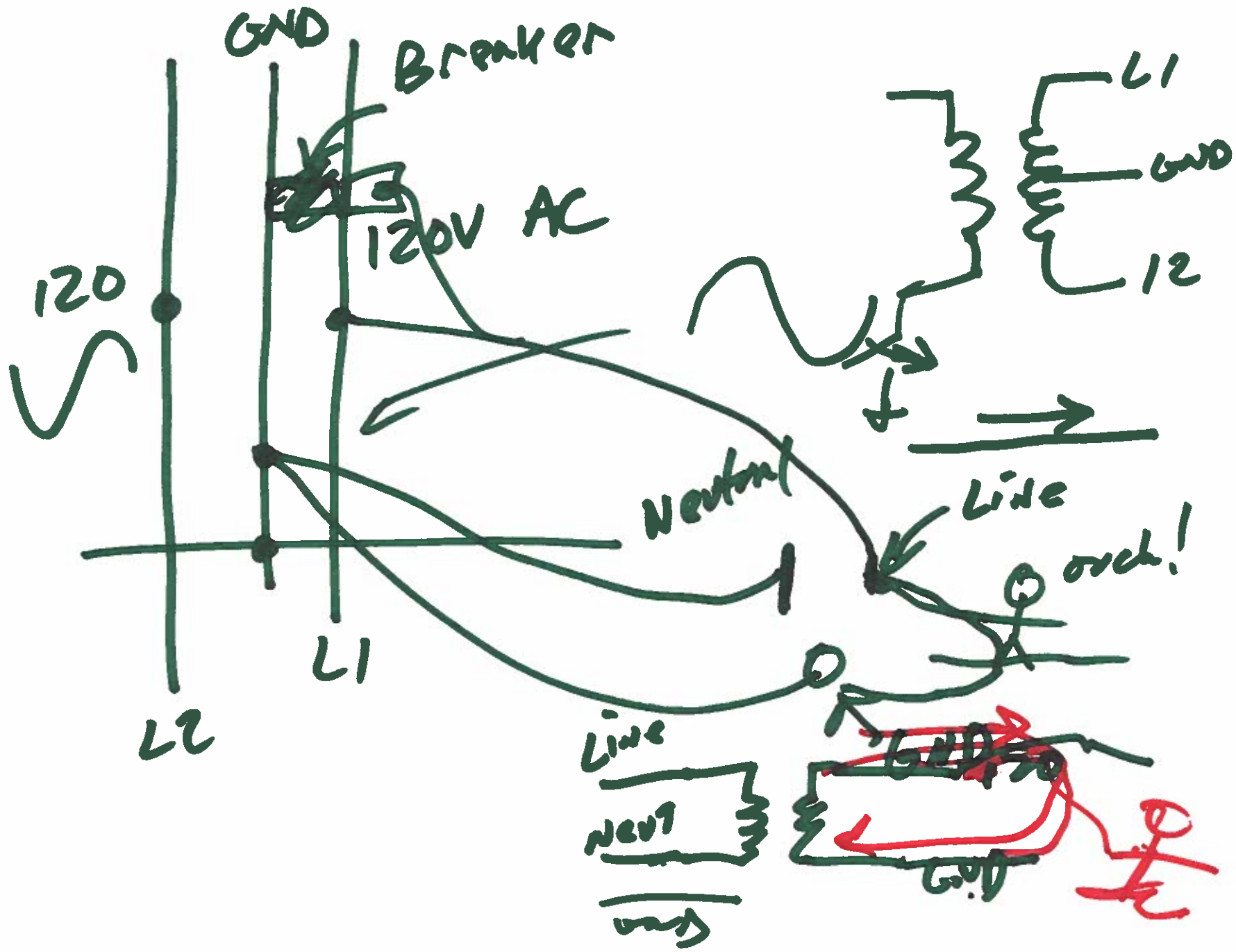
$$j(-433)$$

$$V_{out} = \frac{433.8 \angle 270^\circ}{477 \angle -65^\circ} \cdot 1 \angle 0^\circ$$

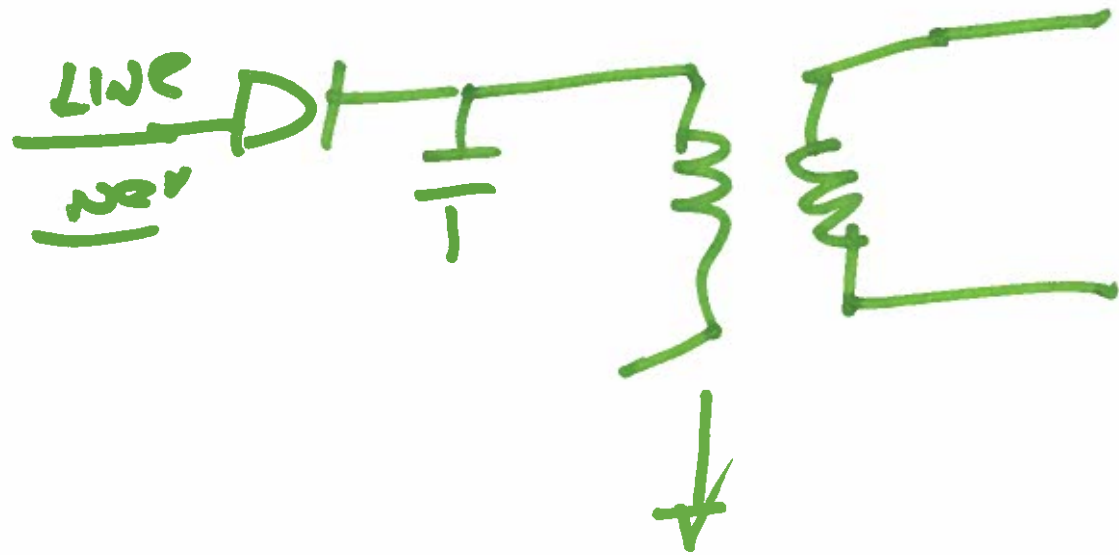
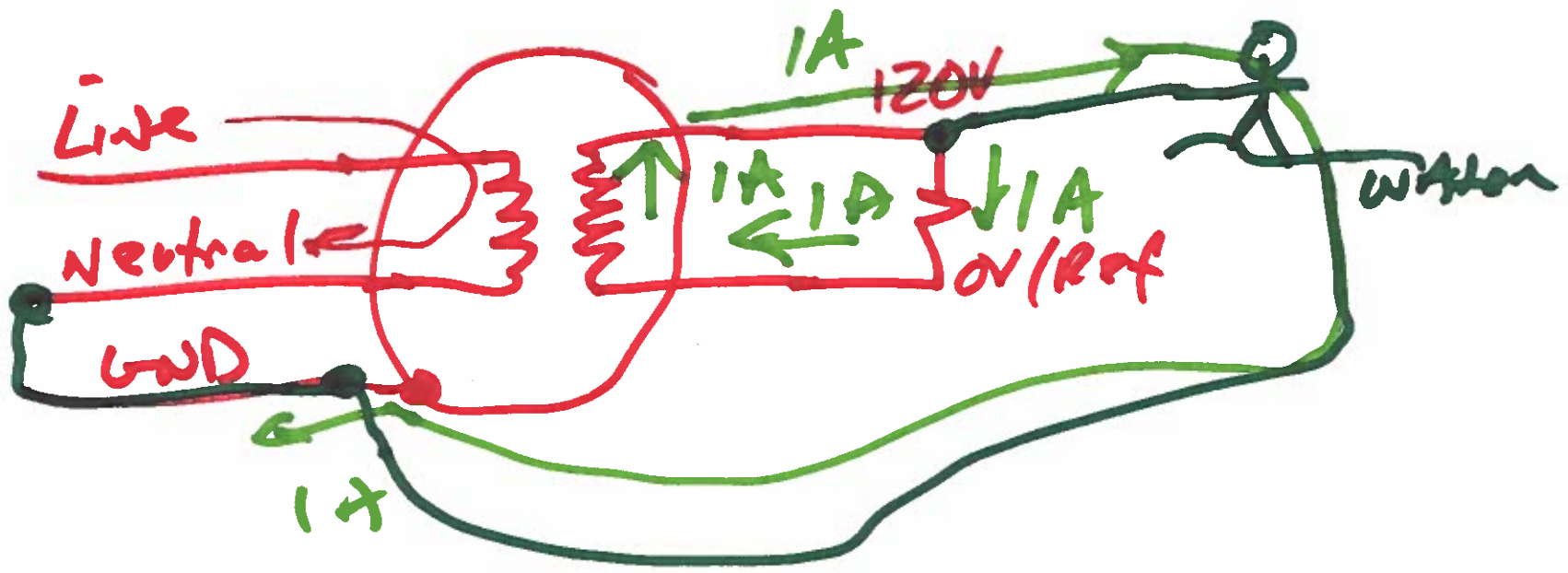
$$= 0.90 \angle 335^\circ$$

$$V_{out} = 0.9 \sin(2\pi \cdot 1k \cdot t + 335^\circ)$$

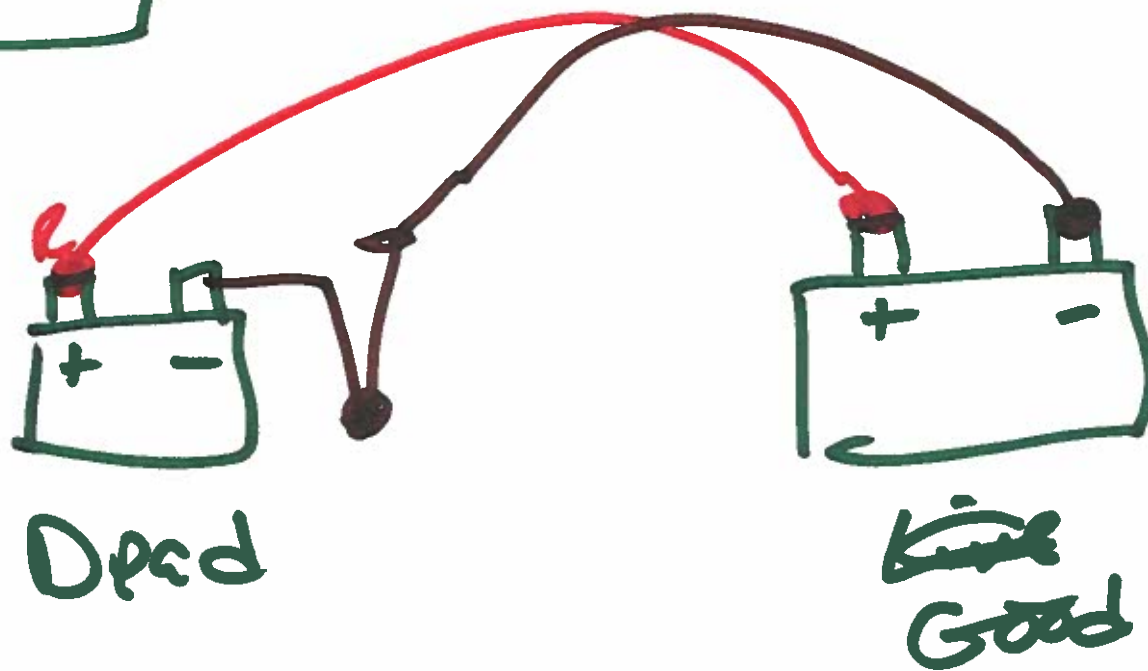
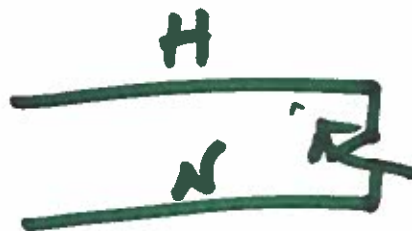
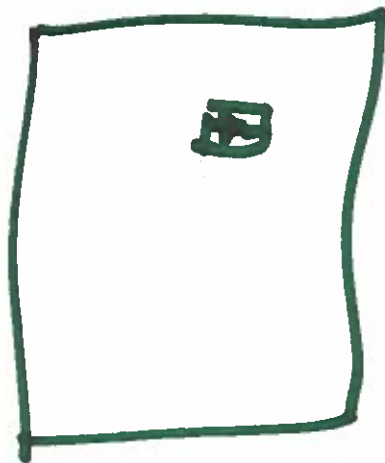
$$0.9 \sin(2\pi \cdot 1k \cdot t - 25^\circ)$$



6)



GFCI



8)