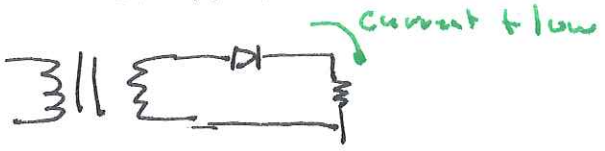
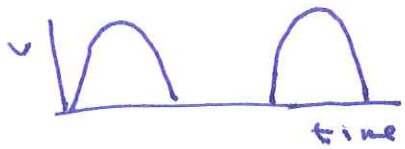
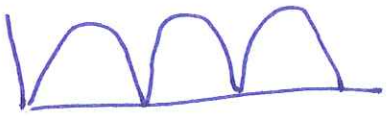
Rectification



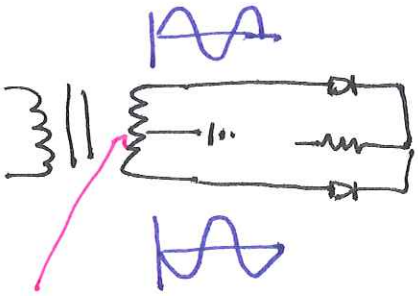


"half wave"

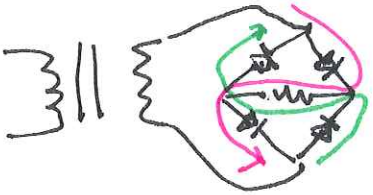


"full wave"

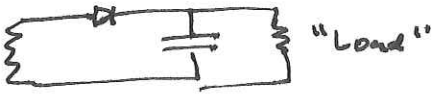
f = 120 Hz

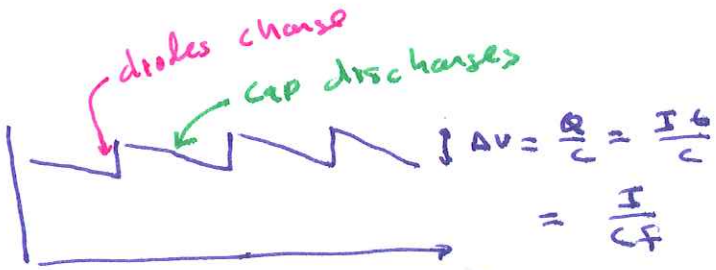


"center tapped"



full wave bridge with 2 diode drops

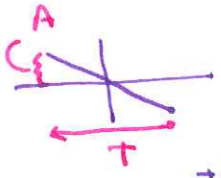




R_{TH}?

$$V_{DC} = V_0 - \frac{1}{2}\frac{IT}{C}$$

what is V_{rms} of sawtooth?



$V = -A\,t/(T/2)$

$$\langle V^2 \rangle = \frac{1}{T}\int_{-T/2}^{T/2} \left(-A\,t/(T/2)\right)^2 dt = \frac{4A^2}{T^3} 2\int_0^{T/2} t^2\,dt$$

$$= \frac{A^2}{3} \rightarrow V_{rms} = \frac{A}{\sqrt{3}}$$

$$V_{rms} = \frac{1}{\sqrt{3}}\frac{I\,T/2}{C}$$

3 terminal regulator