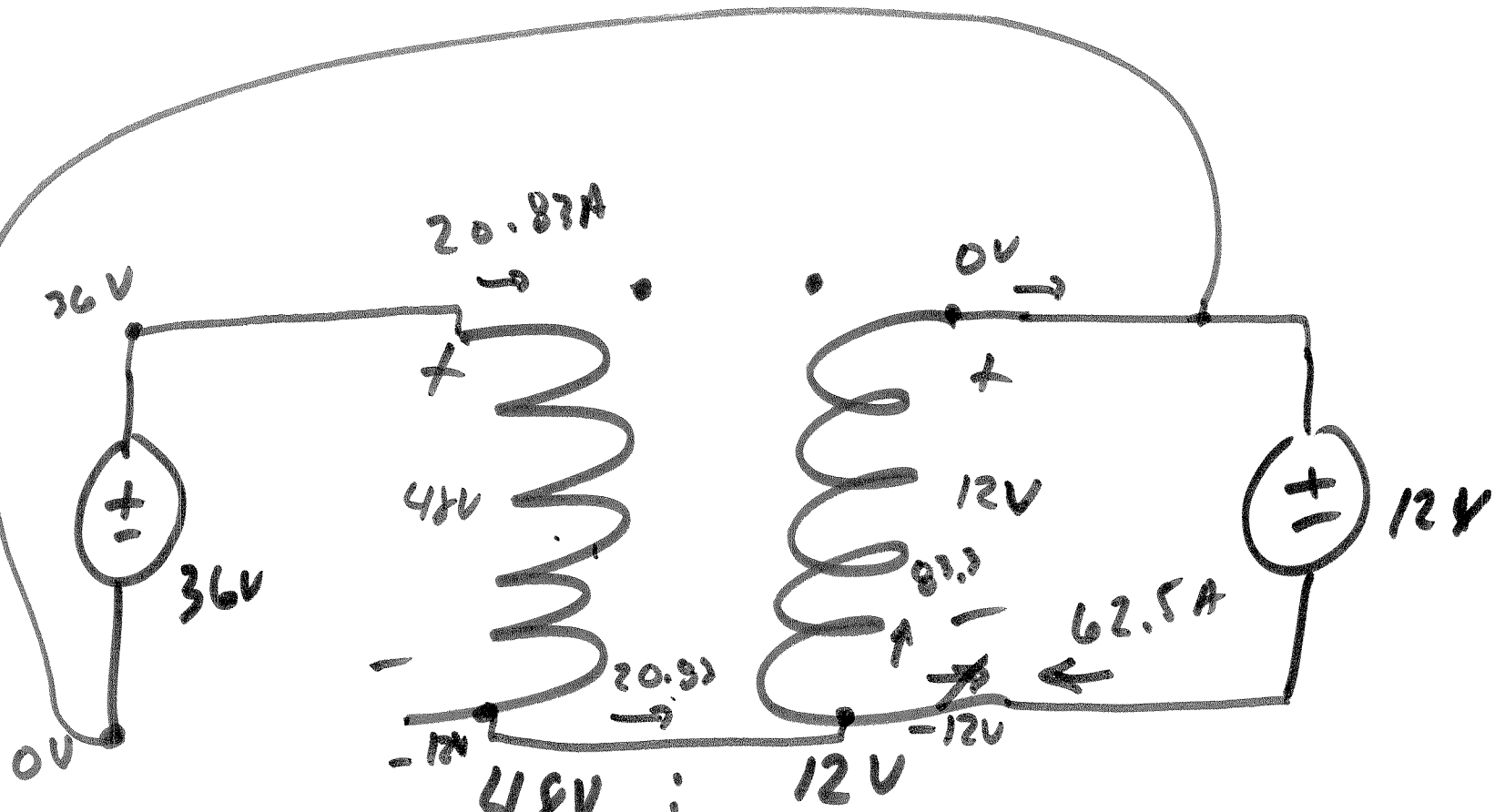
ECE 320 & ECE 329

ENERGY SYSTEMS I

BACKGROUND STUDY IN ENERGY SYSTEMS

SESSION no. 13



FIND KVA FOR 36V : 12V AS AUTO TRANSFORMER.

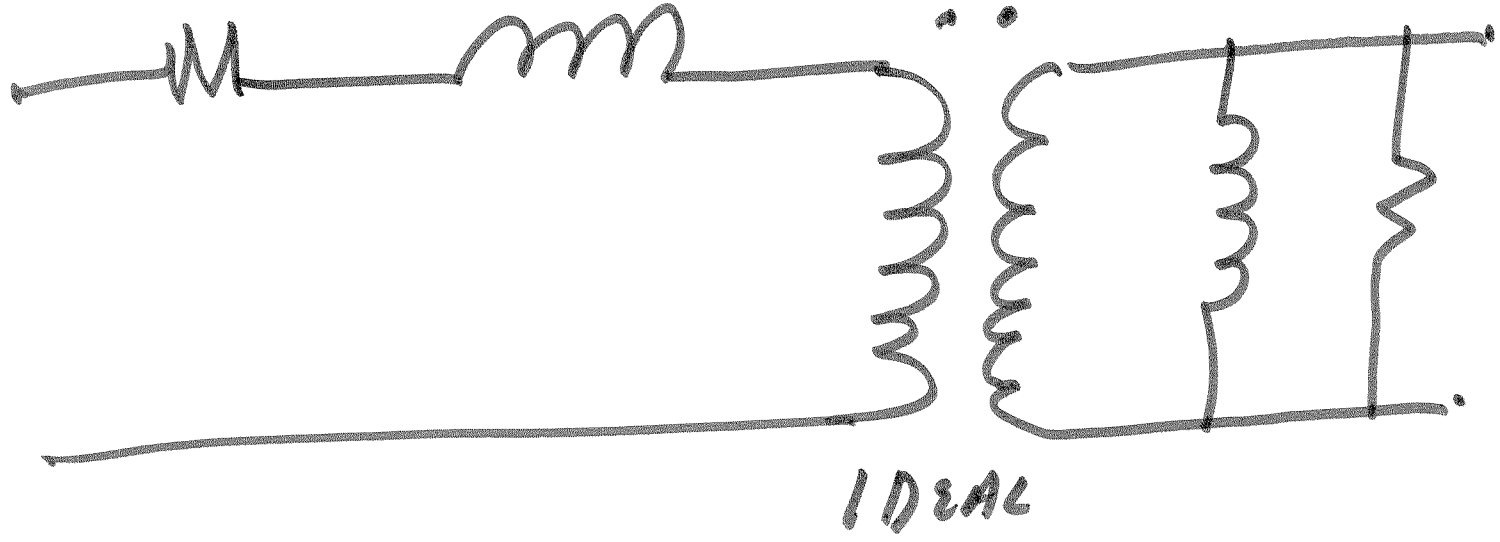
$\frac{1\,KVA}{48V} = 20.83$ $\frac{1\,KVA}{12V} = 83.3A$

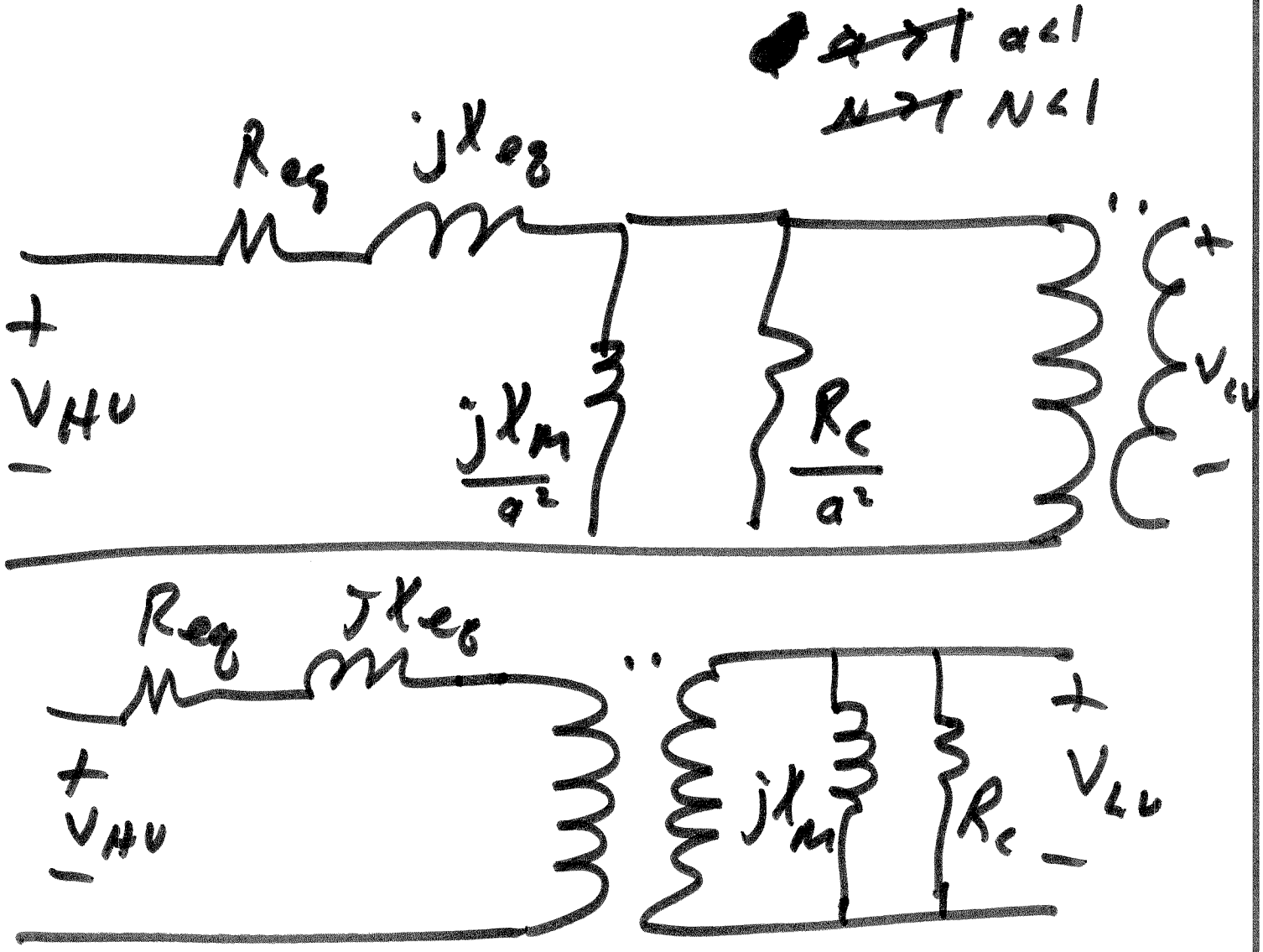
$KVA_{AUTO} = (36V)(20.83A)$

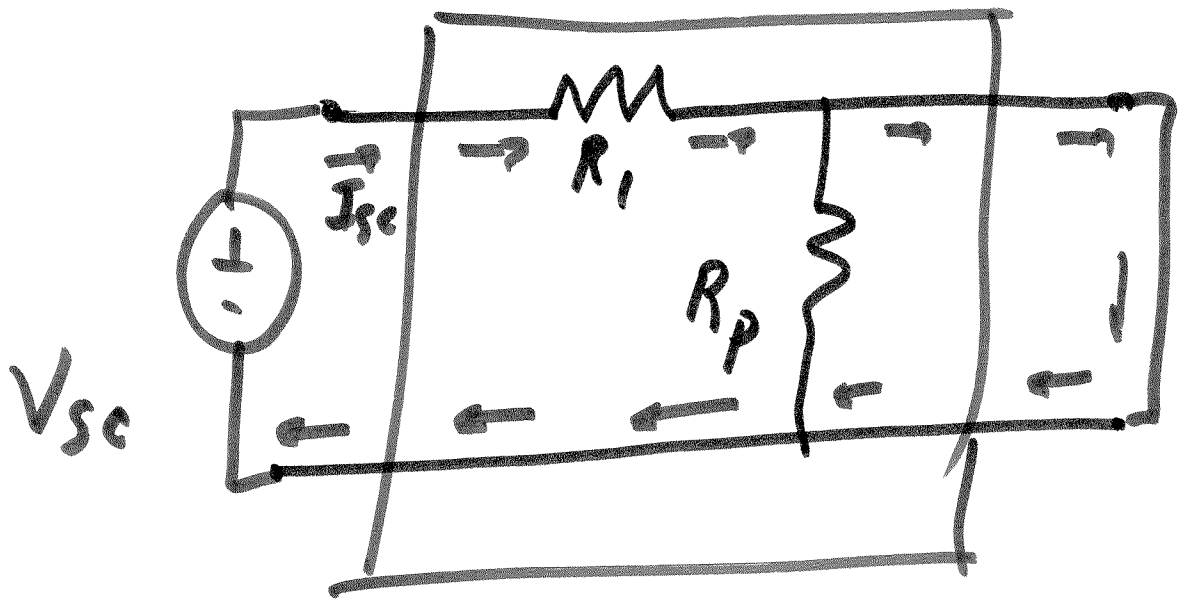
$= 749.88$ ~~[illegible]~~ VA

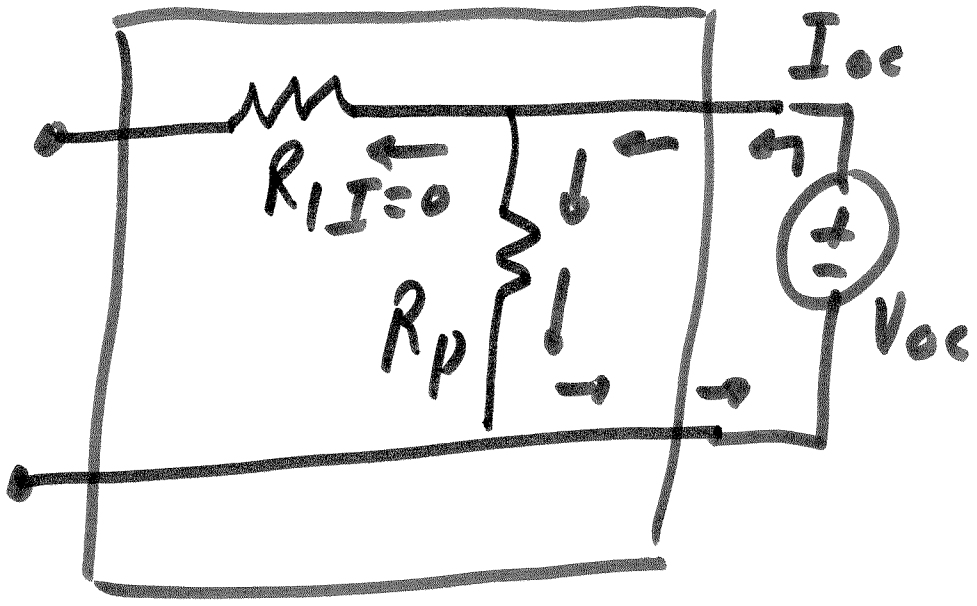
$KVA_{AUTO} = (12V)(62.5A)$

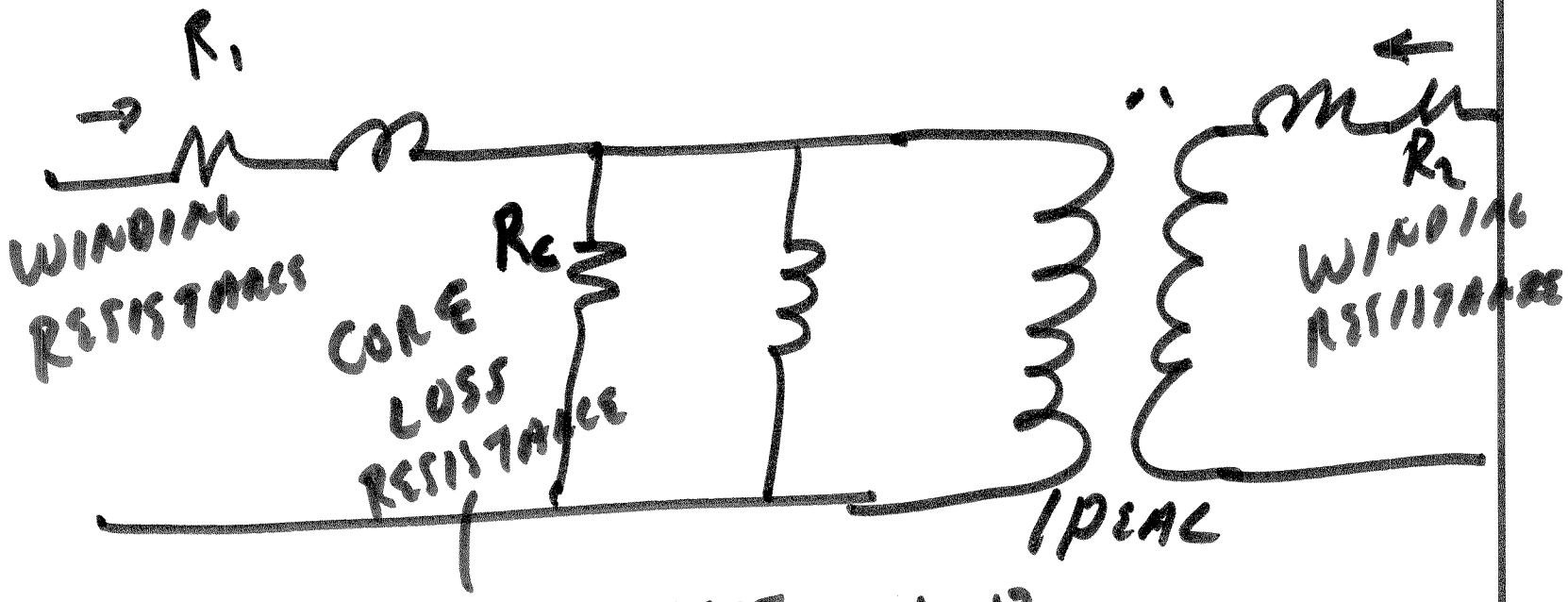
$= 749.88\,VA$


IDEAL


a<1
N<1
R_{eq}
jX_{eq}
+
V_{HV}
−
$\frac{jX_m}{a^2}$
$\frac{R_c}{a^2}$
+
V_{LV}
−
R_{eq}
jX_{eq}
+
V_{HV}
−
jX_m
R_c
+
V_{LV}
−

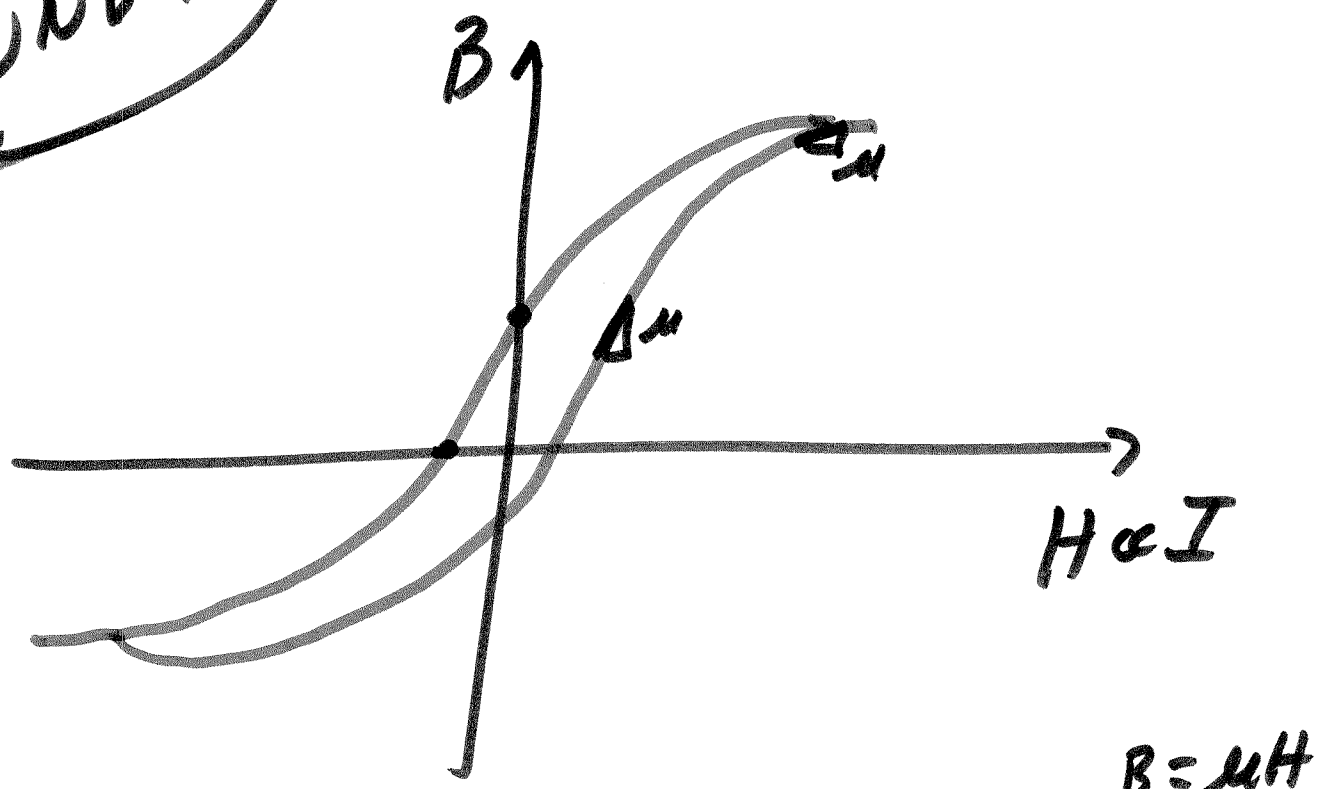

$\vec{I}_{sc}$
R_1
R_p
V_{sc}


Isc
RI I=0
I
Rp
I
Voc



- EDDY CURRENT $\propto |V|^2$
- HYSTERESIS

$V = \omega N B A$



$B = \mu H$

$$\text{Loss} \propto \text{AREA} \propto \frac{|B|^2}{2\mu}$$

$$R = \frac{\rho l}{A}$$

$$\delta = \sqrt{\frac{2}{\omega \mu \sigma}}$$

$$J \propto e^{-\delta x}$$

$$P = \frac{|V|^2}{R} = \frac{|N V_{th}|^2}{N^2 R_{th}}$$

ECE 320

Energy Systems I

Lesson 13

Transformers

Per Unit