

ECE 320 & ECE 329

ENERGY SYSTEMS I
BACKGROUND STUDY IN ENERGY SYSTEMS

SESSION no. 14

Choose 2 of 4

Voltage

Power

Current

Impedance

CALCULATING ZONE

OTGERS

$$I_{BASE} = \frac{S_{BASE}}{V_{BASE}}$$

$$Z_{BASE} = \frac{V_{BASE}}{S_{BASE}}$$

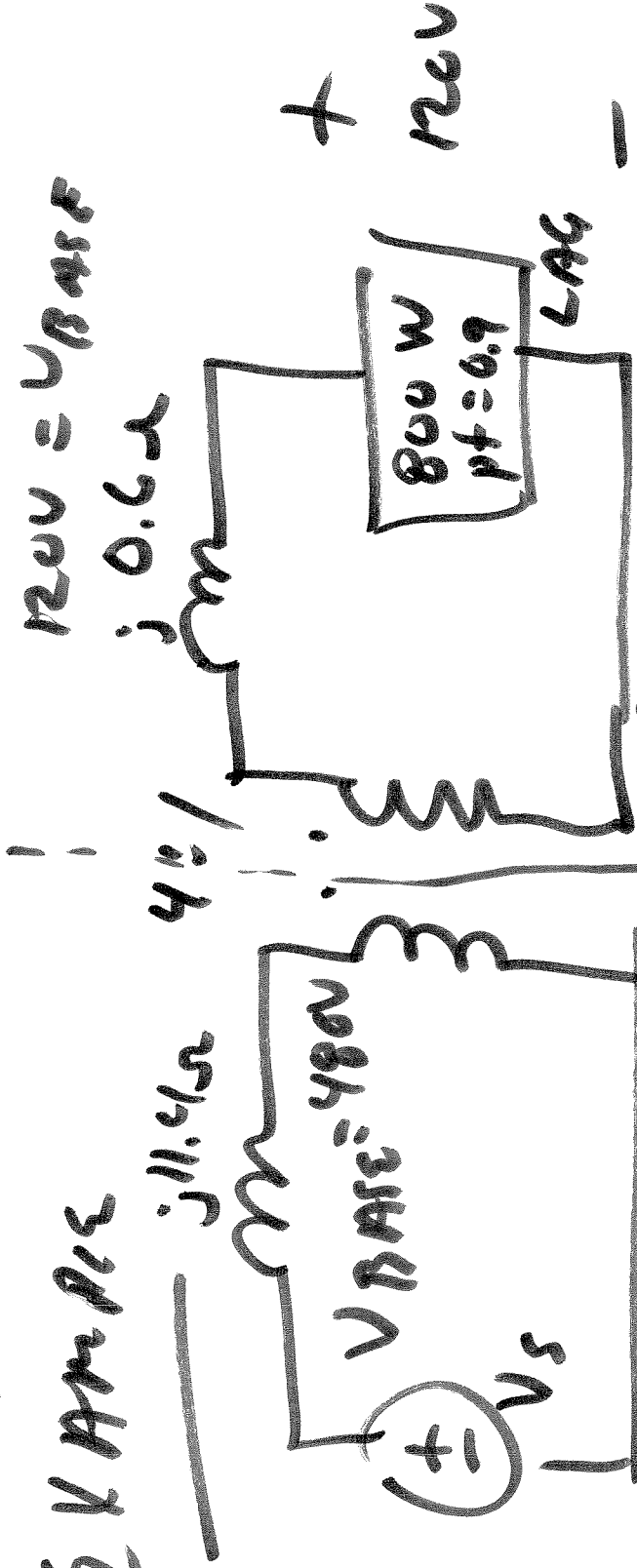
CONVERT PROBLEMS

TO PER UNIT

$$V_{pu} = \frac{V_{test}}{V_{BASE}}$$

$$S_{pu} = \frac{S}{S_{BASE}}$$

2 K AMP RES



• SET UP THE PEN CIRCUIT

EQ 416 W C S A D C I R C U I T

• CHOOSE BASE $S_{BASE} = 800VA$ $\frac{800W}{0.9} = 889VA$

EVERYWHERE IN CIRCUIT

V_{BASE} ... Set up by

turns ratio on

transformer

120V

$$Z_{BASE} = \frac{V_{BASE}^2}{S_{BASE}}$$

$$\frac{(480V)^2}{800VA} = 288\Omega$$

$$Z_{BASE} = \frac{V_{BASE}^2}{S_{BASE}}$$

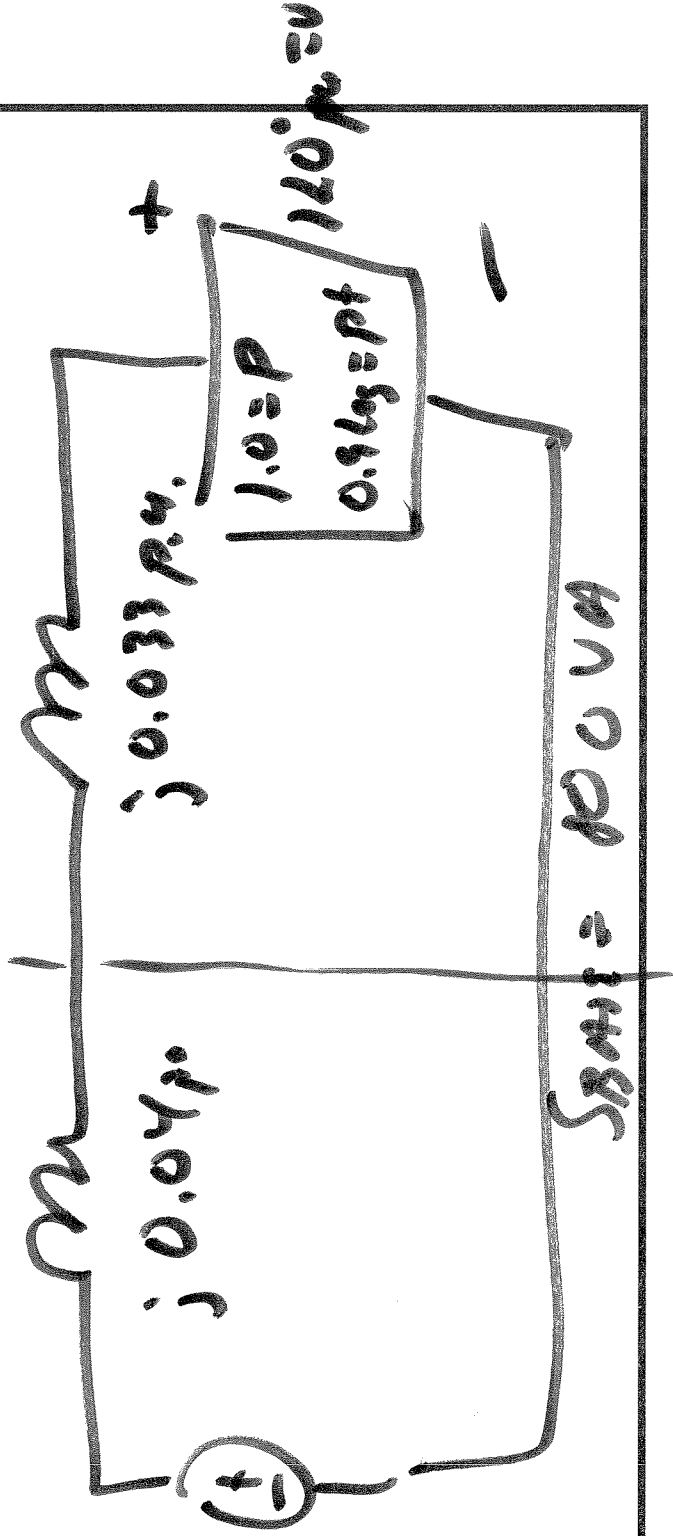
$$Z_{BASE} = \frac{(120V)^2}{800VA}$$

$$Z_{BASE} = 18\Omega$$

$$Z_{pa2} = \frac{j0.6\Omega}{18A} = j0.033\mu\Omega$$

$$Z_{pa1} = \frac{j11.4\Omega}{204A} = 0.04\mu\Omega \quad V_{BASE} = 120V$$

$V_{BASE} = 480V$



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Energy Systems I

Lesson 14

Per unit

*Set up the problem

*Solve it

Set up the problem

Choose a base value