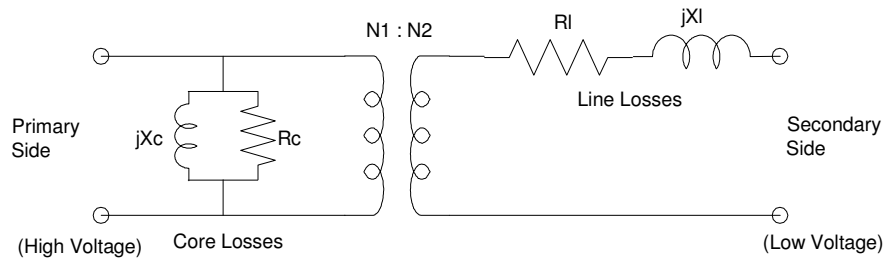


ECE 111: Homework 16

ECE 331 Energy Conversion
Due Monday, May 12th. Please submit via email or on BlackBoard

1) Determine the circuit model for a 13.2kV : 240V transformer is tested with the following test results:



Transformer Model

| | V | Power | pf |
|--------------------|-----------------------|-------|------|
| Open-Circuit Test | $V_1 = 13.2\text{kV}$ | 20 W | 0.01 |
| Short-Circuit Test | $V_2 = 24\text{V}$ | 25 W | 0.98 |

For the utility grid on the back of the page....

- 2) Convert the voltages and impedances to the 120V node (right side)
- 3) Write the voltage node equations for this circuit (with transformers removed)
- 4) Determine the voltages at each node
- 5) Determine the efficiency of this system
 - Ignoring the core losses
 - Assumes a large number of customers share these losses
 - Including the core losses
 - Assumes a single customer

