ECE 320 / ECE 329 Recitation Monday 13 February 2012
Homework 4
Per Unit Normalization

Do the following problems from the textbook:

1. 2.1 b on page 144

2. 2.1 c on page 144. Work the problem in per unit. Leave the answer in per unit.

3. 2.24 a and 2.24 b on page 150. Set up the problem in per unit. Work the problem in per unit.

4. 2.14 on page 148. Work the problem in per unit this time, both without the effect of the transformers in the circuit (circuit (a)) and then with the effect of the transformers (circuit (b)).

5. A one-line diagram of an unloaded power system is shown below. Reactances of the two sections of transmission line are shown on the diagram. The generators and transformers are specified as follows:

Generator 1	20 MVA	6.9kV	X=0.15 per unit
Generator 2	10 MVA	6.9kV	X=0.15 per unit
Generator 3	30 MVA	13.8kV	X=0.15 per unit
Transformer 1	25 MVA	6.9kV : 115kV	X=10%
Transformer 2	12 MVA	6.9kV : 115kV	X=10%
Transformer 3	3 single phase transformers, each 10 MVA, 6.9 : 69kV, X=10%		

Draw a circuit diagram for one phase of this system with all reactances marked in per unit. Choose a base of 30 MVA and 6.9kV at generator 1.