ECE 420
Homework #2
Transformers

**1.** (2.5 points) **Ideal Transformer.**

a. (1.5 points) Beginning with the voltage and current relations of an ideal transformer (equations 2-4 and 2-5 in the textbook), derive the formula for reflection of impedance across an ideal transformer.

b. (1 points) Figure 2-37c on page 122 of the text shows a wiring diagram for a Delta-Wye three phase transformer. The phase shift, according to the text below the figure, is 30 degrees with the secondary leading the primary. Draw a wiring diagram for a Delta-Wye three phase transformer where the secondary lags the primary by 30-degrees.

2. (2.5 points) **Single Phase Steinmetz Model.** Do Problem 2.1 on page 144 of the textbook.

3. (2 points) **Three Phase Transformer Connections and Ratings.** Do Problem 2.10 (a) (b) (c) and (d) on page 147 of the textbook.

4. (1 points) **Three Phase Steinmetz Model.** Do Problem 2.12 (a) on page 147 of the textbook. Work in Volts, Amps, and Ohms. State which side of the transformer your diagram is referred.

5. (2 points) **Transformers in a Distribution System.** Do Problem 2.14 on page 148 of the textbook.