PHYS 212 Homework on Transformers Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Write down the ideal-transformer equations.



P63. A transformer has 500 primary turns and 10 secondary turns. (a) If *Vp* is 120 V (rms), what is *Vs* with an open circuit? If the secondary now has a resistive load of 15 *Ω*, what is the current in the (b) primary and (c) secondary?

P65: An ac generator provides emf to a resistive load in a remote factory over a two-cable transmission line. At the factory a step-down transformer reduces the voltage from its (rms) transmission value *Vt* to a much lower value that is safe and convenient for use in the factory. The transmission line resistance is 0.30 *Ω*/cable, and the power of the generator is 250 kW. If *Vt* = 80 kV, what are (a) the voltage decrease *ΔV* along the transmission line and (b) the rate *Pd* at which energy is dissipated in the line as thermal energy? If *Vt* = 8.0 kV, what are (c) *ΔV* and (d) *Pd*? If *Vt* = 0.80 kV, what are (e) *ΔV* and (f) *Pd*?