Transformer Worksheet

Name:_____

$V_{out} = (n_s/n_p)\cdot V_{in}$

Where V_{out} = voltage out
(n_s/n_p) = # secondary coils divided by # primary coils
V_{in} = voltage in

$$\frac{I_s}{I_p} = \frac{V_p}{V_s} = \frac{N_p}{N_s}$$

1. The primary coil of a transformer has 30 loops around the iron core. The secondary coil has 10 loops. If voltage-in is 240 volts, what is voltage-out?

2. A sub-station must step down from v_{in} = 1,000,000 volts to v_{out} = 10,000 volts. Find the ratio n_s/n_p

3. A transformer outside your house steps the voltage down from v_{in} = 960 volt. The # primary coils is 160 and the # secondary coils is 40. Find v_{out}.

4. A multi-stage transformer has 100 primary coils. The secondary loop can be connected to have 100, 50, or 20 secondary coils. If voltage incoming is to be cut in half, how many secondary coils should be chosen?

5. A cell phone charger takes incoming voltage of 120 volts and outputs 5 volts. Find the ratio of n_s/n_p

6. House side of a transformer gives 220 VAC and 50 amps of current max. If the primary side of the transformer is running at 11,000 VAC, what is the current on the primary side and what is the ratio of coils Np/Ns?

7. Primary side of a transformer has 75 coils, 240 VAC, and 15 amps of current. If the secondary side is running 30 amps, find secondary coils and voltage.

8. Solar cells on the roof of a house develop (through the inverter) a max voltage of 240 VAC at 23 amps. To get 120 VAC, a transformer is used with an 80/40 Np/Ns ratio. What current is available?