**PHYS 202 Transformers**  Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Read section 22.9, Transformers, Chapter 22, Textbook.

<https://www.youtube.com/watch?v=ZjwzpoCiF8A> (8 min)

<https://www.youtube.com/watch?v=VucsoEhB0NA> (2 min. Animation)

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| Image described by surrounding text. | fig22_29 |

1. Using the Faraday’s law of induction, derive the following equations which relates the primary and secondary properties of a transformer.   
 and 

2. Under what assumption the above second equation is valid.

3. (Problem-67) A generating station is producing 1.2pixel×pixel106 W of power that is to be sent to a small town located 7.0 km away. Each of the two wires that comprise the transmission line has a resistance per kilometer of length of 5.0pixel×pixel10–2 Ω/km. (a) Find the power lost in heating the wires if the power is transmitted at 1200 V. (b) A 100:1 step-up transformer is used to raise the voltage before the power is transmitted. How much power is now lost in heating the wires? (Power loss in transmission lines,)