

Transformers (40:06)

Explain the relationship of current flow and magnetism in terms of strength and polarity.

Explain the electromagnetic induction process.

Compare and contrast traditional generators with transformers.

Draw the schematic symbol for a transformer.

Differentiate between the terms primary and secondary.

Describe the relationship of turns ratio and voltage for an ideal transformer.

Differentiate between the terms step up and step down transformer.

Given a transformer with 300 turns on the primary and 60 turns on the secondary determine the turns ratio and the output voltage when supplied by 120V input.

Determine the turns ratio necessary to transform 240V input to 24V output.

Determine the turns ratio necessary to transform 208V input to 24V output.

Identify the purpose of tapped transformers.

Given a transformer with a 1:50 turns ratios determine the output voltage when supplied by 690V input.

Determine the turns ratio for a step transformer that outputs 138kV when supplied by 34.5kV.

Identify different types of transformers.

Describe power transfer for ideal transformers. Describe how changes in output voltage influence output current.

Describe the relationship of turns ratio and current for an ideal transformer.

Given a 5:1 step down transformer powered by 120V and a 50Ω load determine the current in the primary and the secondary windings and the input and output power.

Given a 5:1 step down transformer powered by 120V and a 20Ω load determine the current in the primary and the secondary windings and the input and output power.

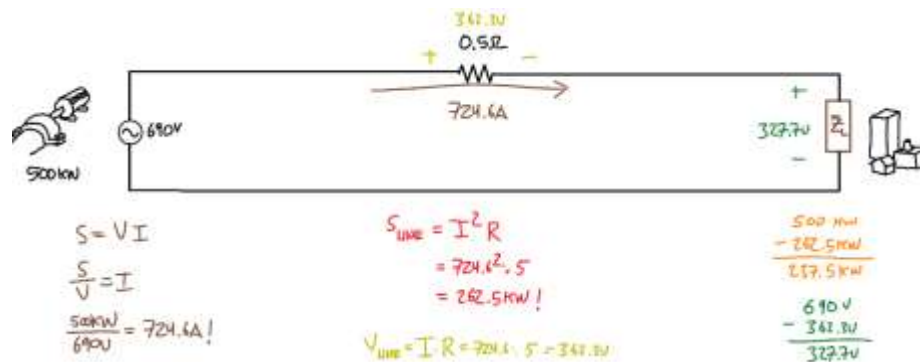
Identify the method of calculating the reflected impedance seen by the source.

Given a 1.73:1 step down control transformer powered by 208V with a $1.6k\Omega$ resistive load, determine the secondary voltage, the secondary current, the power output by the secondary, the primary current, primary power, and the reflected impedance seen by the source.

Given a step up transformer powered by 120V supplying 220V to a motor modeled as an impedance of $260\Omega \angle 32^\circ$ determine the required turns ratio, the secondary current, the power output by the secondary, the primary current, the primary power, and the reflected impedance seen by the source.

Identify the purpose of transformers.

Given a 500kW generator that operates at 690V determine the current supplied by the generator, the voltage loss across a transmission line modeled as a 0.5Ω resistor, and the voltage and power delivered to the destination.



Given a 500kW generator that operates at 690V and is stepped up to 34.5kV determine the current supplied by the generator, the voltage loss across a transmission line modeled as a 0.5Ω resistor, and the voltage and power delivered to the destination.

