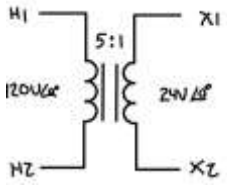
Transformer Connection Diagrams (42:14)

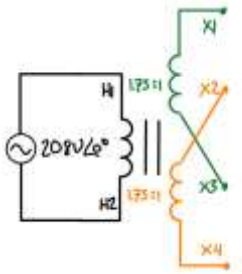
Describe how manufacturers use phase dots to identify transformer polarity.

Given this transformer draw the waveforms between H1 and H2 and X1 and X1 and X2 when labeled in the following fashions: phase dots on H1 and X1
phase dots on H1 and X2



Identify methods of experimentally determining transformer winding polarity for a transformer not employing phase dots.

Given this transformer, place phase dots in the appropriate places given the following information:



H2 connected to X3: 88V differential observed between X1 and H1
H2 connected to X2: 328V differential observed between X4 and H1

Given the above transformer determine the differential between X1 and X2 when X3 and X4 are tied together.

Discuss how transformers are rated.

Given the above transformer with the following ratings:
secondary winding X1 to X3: 120V, .5A
secondary winding X2 to X4: 120V, .5A
Determine the apparent power rating of each winding and the complete transformer.

Discuss how placing secondary windings in parallel with one another affects the power output of a transformer.

Draw how accessory bars or voltage links would be used to place the windings of the above transformer in parallel with one another.

Discuss how placing secondary windings in series with one another affects the power output of a transformer.

Draw how accessory bars or voltage links would be used to place the windings of the above transformer in series with one another.

Discuss why the polarity of transformer secondary windings is essential when placing windings in series or parallel with one another.

Given this transformer with multiple secondary windings each with a 120VA rating determine the rated current for each secondary winding and the rated power and current for the primary winding.

Discuss how different voltage and current ratings affect the physical construction of transformers.

Given the above transformer determine the current and power for each secondary winding in the following configuration:

X1 to X2 4.8Ω resistive load
X3 to X4 4.8Ω resistive load
X5 to X6 30Ω resistive load

Given the above transformer determine the current and power for each active secondary winding in the following configuration: X1 to X2 and X3 to X4 in parallel with one another, 2.4Ω resistive load

Given the above transformer determine the current and power for each active secondary winding in the following configuration: X1 to X2 and X3 to X4 in series aiding configuration with one another, 9.6Ω resistive load

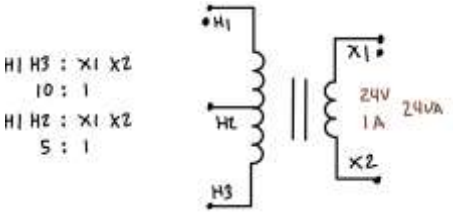
Given the above transformer determine the output voltage, rated current, and rated power for a series aiding configuration of X3 to X4 and X5 to X6. Discuss how this configuration underutilizes the transformer.

Given the above transformer determine the output voltage, rated current, and rated power for a series opposing configuration of X3 to X4 and X5 to X6. Discuss how this configuration underutilizes the transformer.

Given the above transformer determine the output voltage, rated current, and rated power for a series aiding configuration of X1 to X2, X3 to X4 and X5 to X6.

Discuss the benefits and drawbacks of series aiding and opposing configurations of transformers with secondary windings employing different current ratings.

Given the transformer with multiple tapped inputs below determine the input voltage and rated current for the primary winding sufficient to produce 24V at the output.



Discuss the benefits and drawbacks of transformers with multiple tapped inputs.

Discuss the implications of operating a transformer at conditions of other than the rated voltage.

Discuss the implications of operating the above transformer as a 1:10 step up transformer when powered by 24V between X1 and X2 and supplying a load between H1 and H3.

Describe an autotransformer. Discuss advantages and disadvantages of autotransformers.