


SKEE 1023 Circuit Theory
Meeting 6
Sinusoidal Steady-State Analysis
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Sinusoidal Steady-State Analysis
Chapter 6

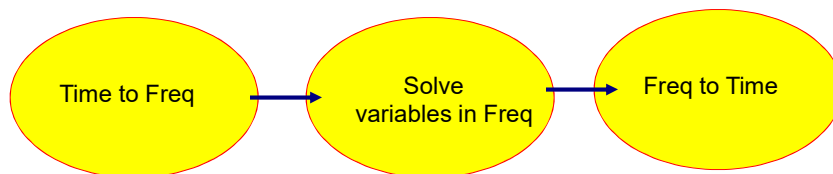
- 6.1 Basic Approach
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- 6.5 Source Transformation
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6.1 Basic Approach (1)

Steps to Analyze AC Circuits:

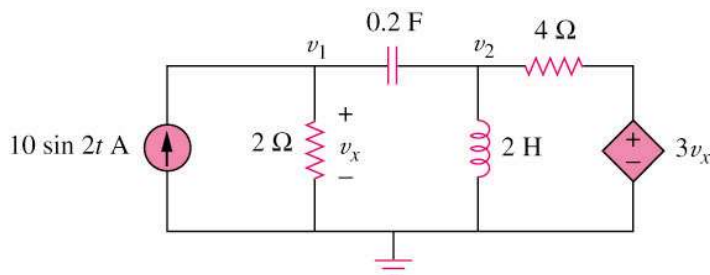
1. **Transform** the circuit to the **phasor or frequency domain**.
2. **Solve** the problem using circuit techniques (nodal analysis, mesh analysis, superposition, etc.).
3. **Transform** the resulting phasor to the time domain.



6.2 Nodal Analysis (1)

Example 1

Using nodal analysis, find v_1 and v_2 in the circuit of figure below.



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6.3 Mesh Analysis (1)

Example 2
Find I_o in the following figure using mesh analysis.

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6.4 Superposition Theorem (1)

When a circuit has sources operating at different frequencies,

- The separate phasor circuit for each frequency must be solved independently, and
- The total response is the sum of time-domain responses of all the individual phasor circuits.

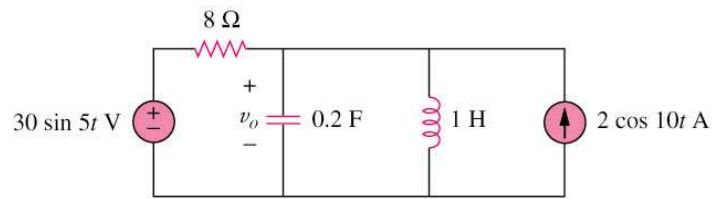
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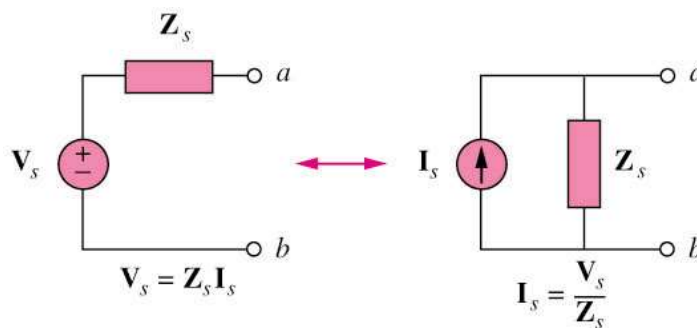
6.4 Superposition Theorem (2)

Example 3

Calculate v_o in the circuit of figure shown below using the superposition theorem.



6.5 Source Transformation (1)



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6.5 Source Transformation (2)

Example 4
Find I_o in the circuit of figure below using the concept of source transformation.

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6.6 Thevenin and Norton Equivalent Circuits (1)

Thevenin transform

Norton transform

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6.6 Thevenin and Norton Equivalent Circuits (2)

Example 5

Find the Thevenin equivalent at terminals a–b of the circuit below.

