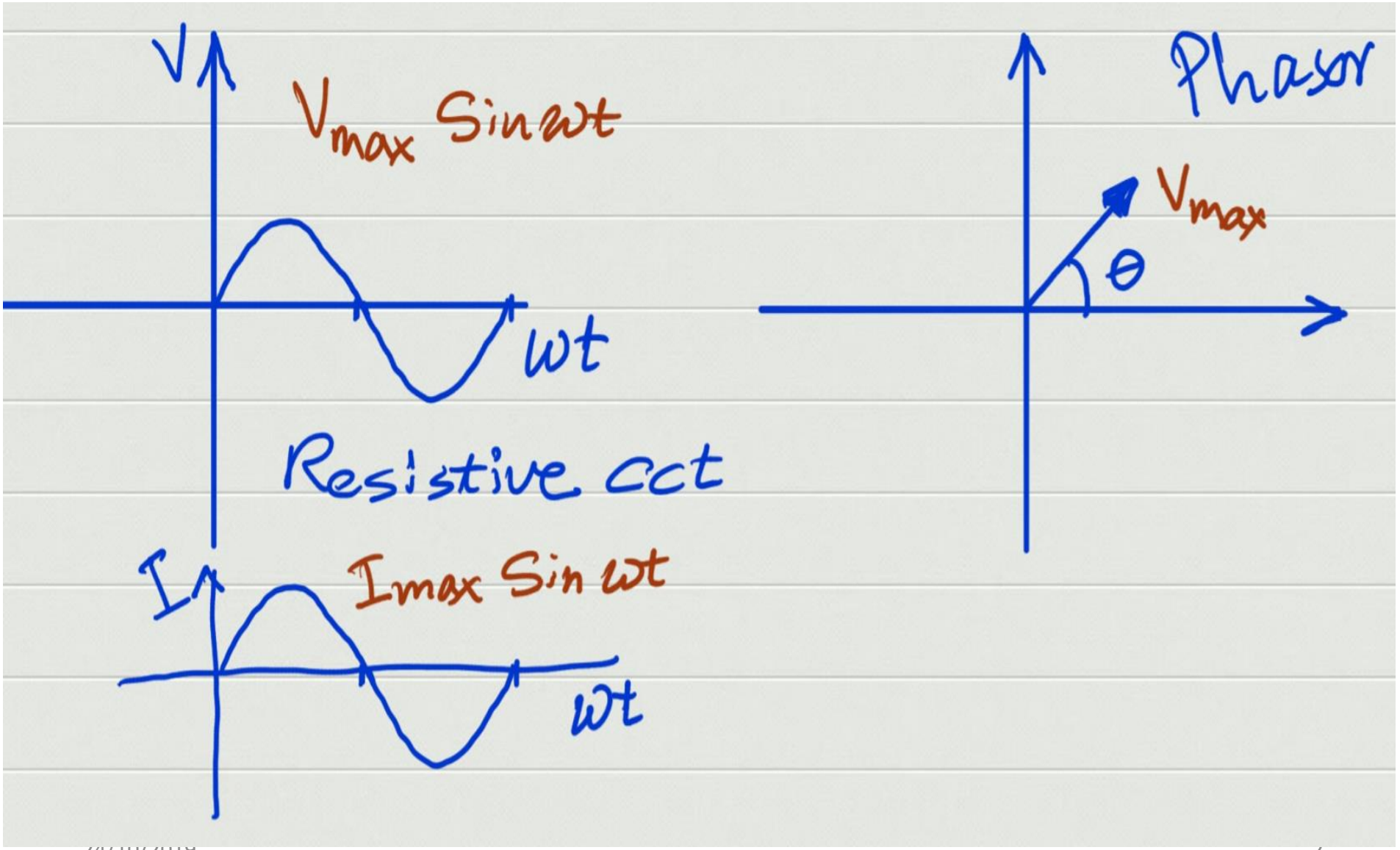
Electromechanical Systems

001.0

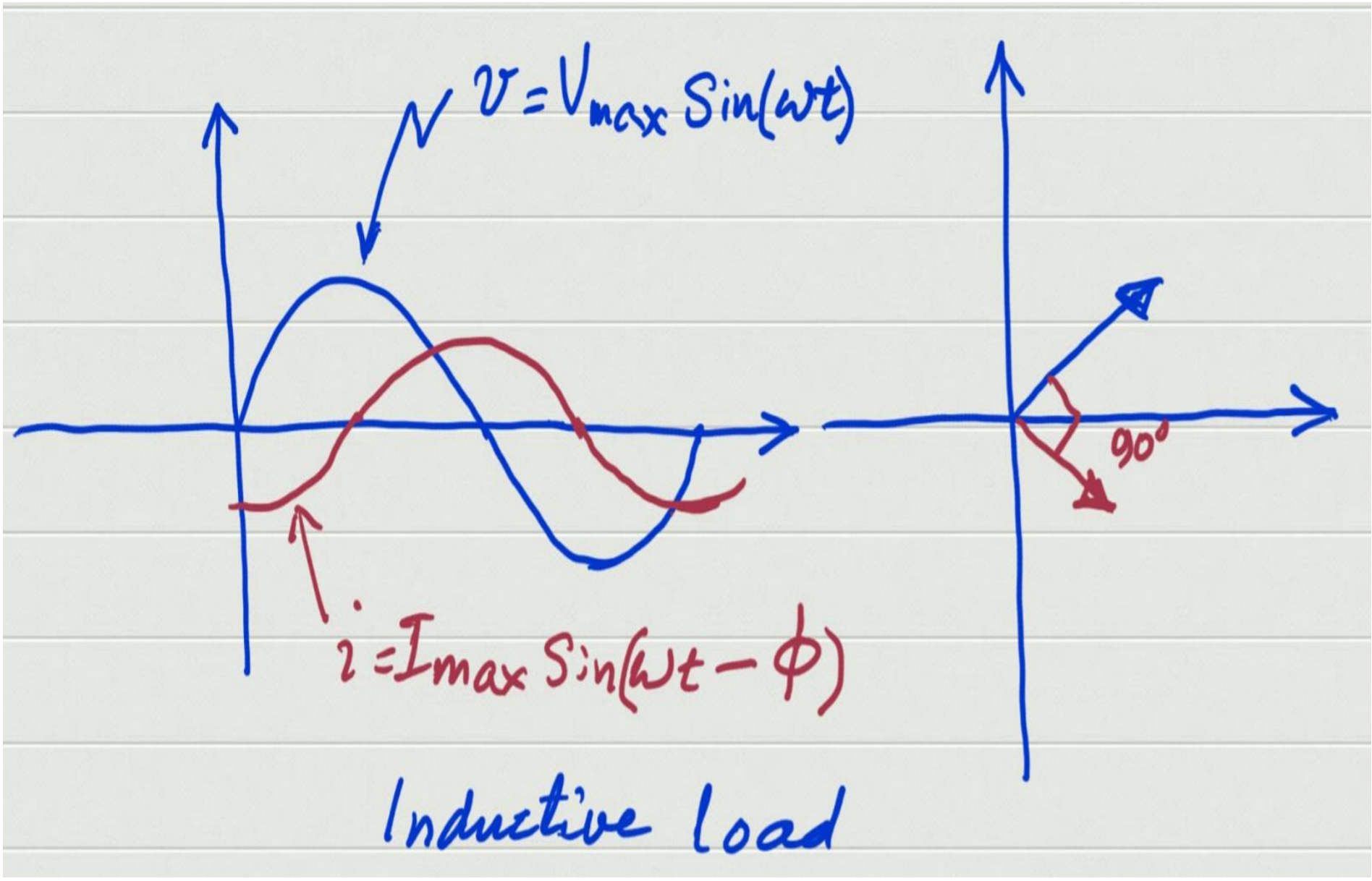
Introduction

Dr Ezideen A Hasso

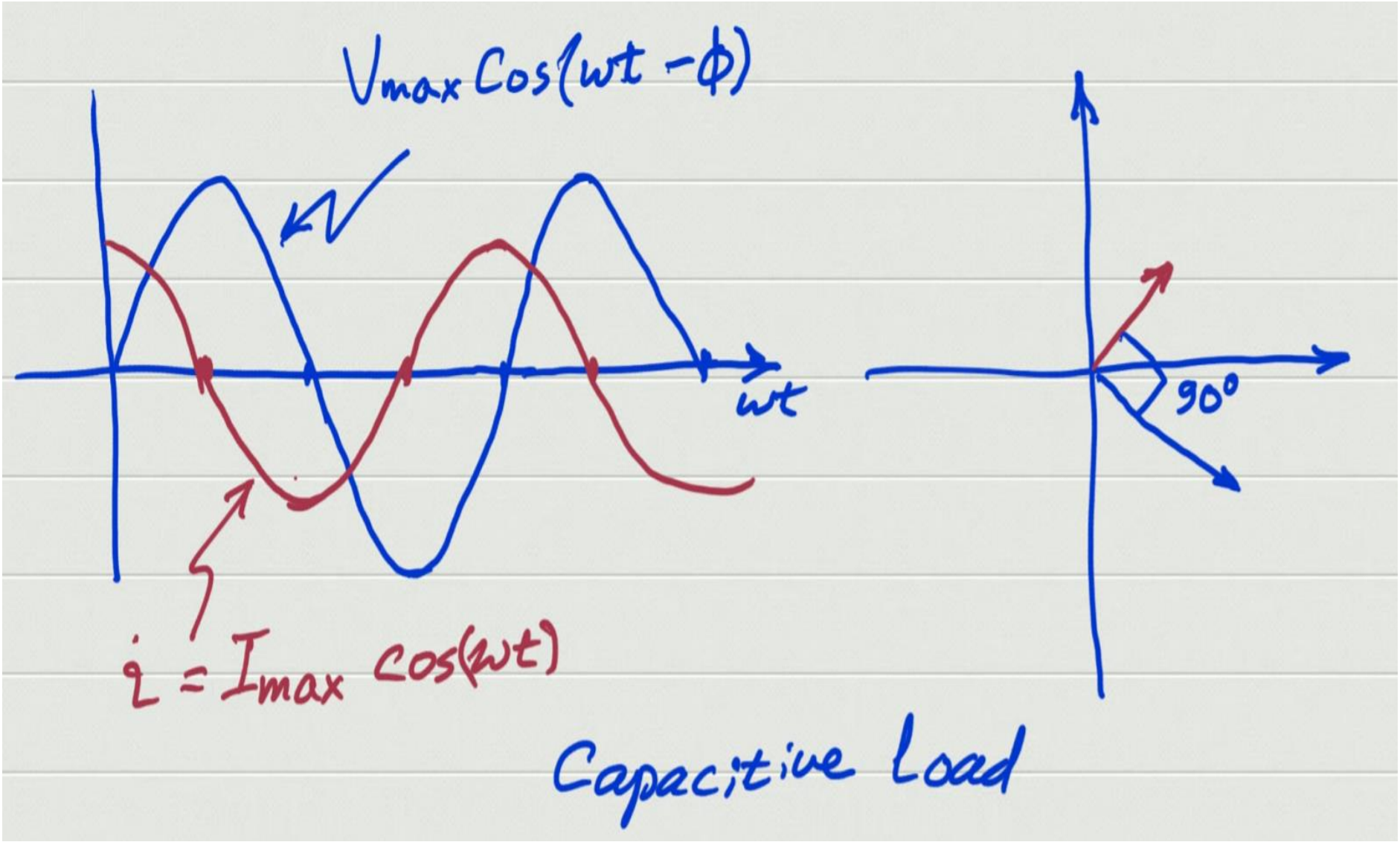
Phasors in AC Circuits



Inductive Load



Capacitive Load



Reference Book

Principles of Electrical Machines and Power Electronics, P C Sen

Resistor $v = iR$

Inductor $v = L\frac{di}{dt}$, $i = \frac{1}{L}\int v\,dt$

Capacitor $i = C\frac{dv}{dt}$, $v = \frac{1}{C}\int i\,dt$

Euler Formula

e^x, e^t → what is special about this?

When we take the derivative of this function we get a scaled function of the original

- $\frac{d}{dx}(e^x) = e^x$ ← same function
- $\frac{d}{dt}(e^{rt}) = re^t$ ← scaled function

$$e^{jx} = \cos(x) + j\sin(x)$$

$$e^{-jx} = \cos(x) - j\sin(x)$$

$$\cos(x) = \frac{e^{jx} + e^{-jx}}{2}$$

$$\sin(x) = \frac{e^{jx} - e^{-jx}}{2j}$$

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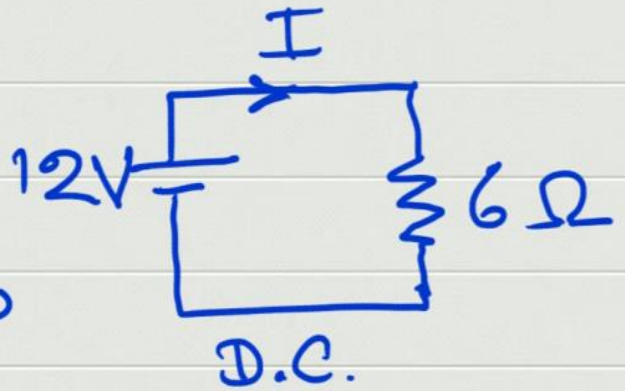
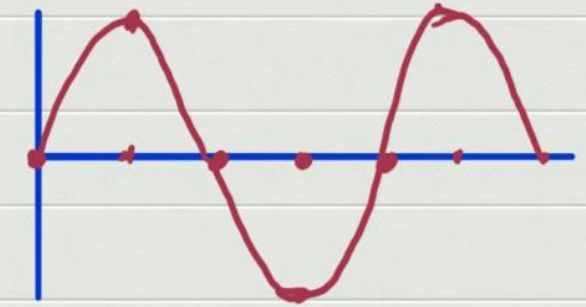
A.C. Circuits

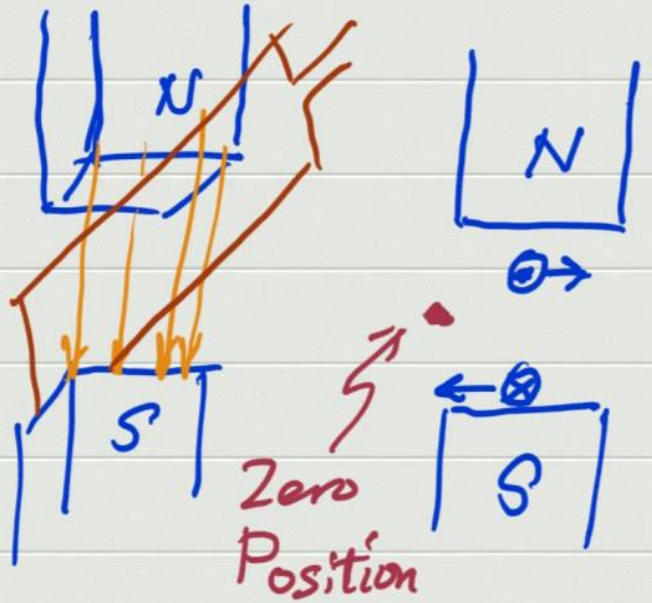
Ohm's law

$$I = \frac{V}{R} = \frac{12}{6} = 2 \text{ Amp}$$

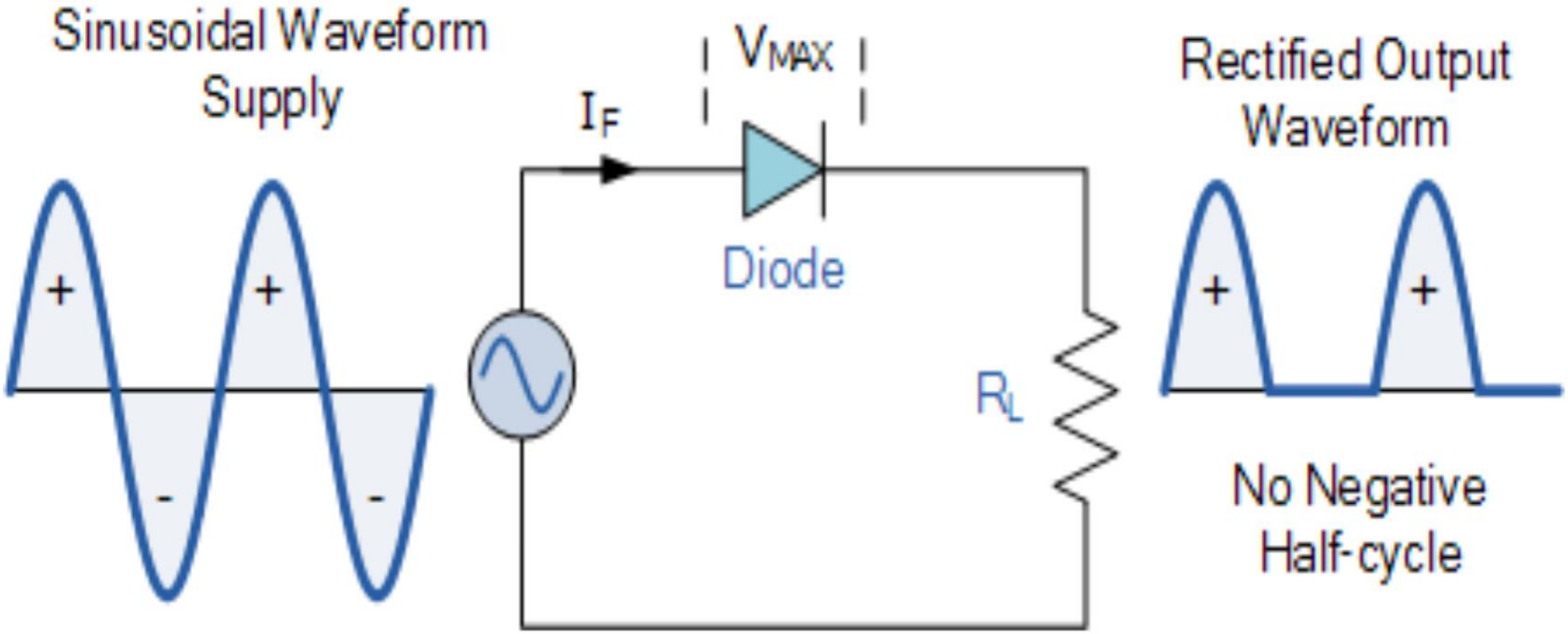


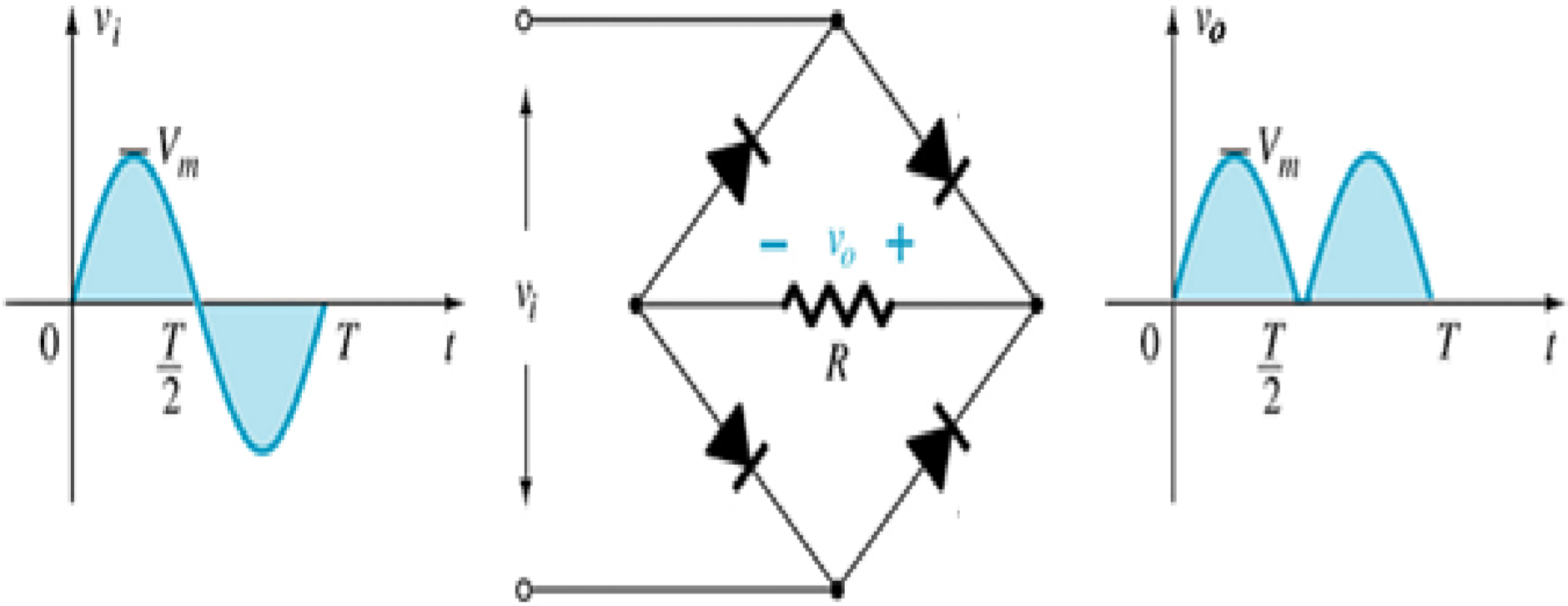


$$emf = -\frac{d\phi}{dt}$$



Half Wave Rectifier

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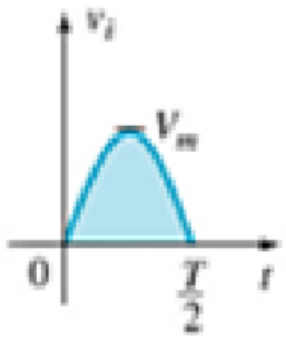
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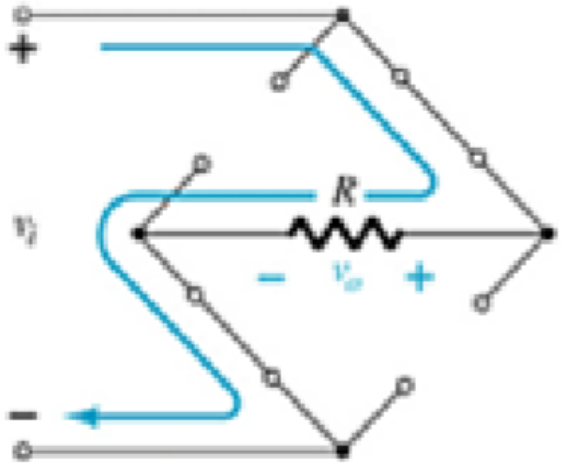
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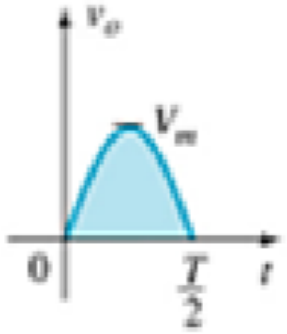
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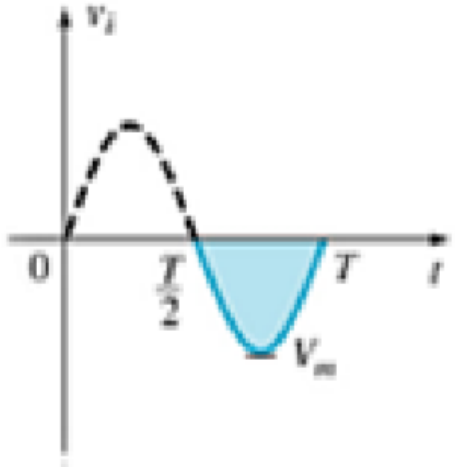
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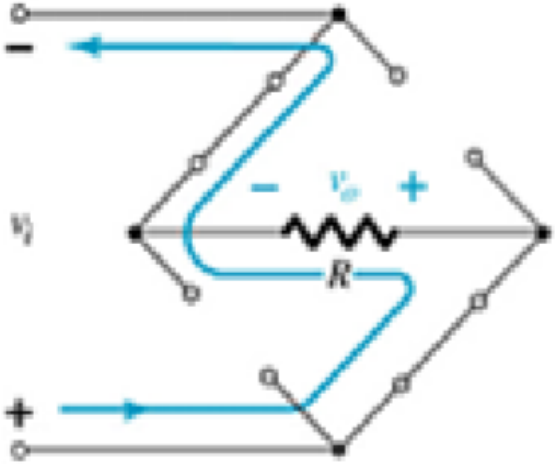
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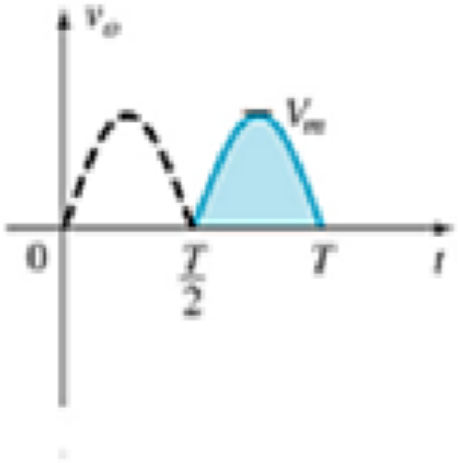
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