PRINCIPLES OF EE1

HW

Deadline: 8:00, 1 JUNE 2024

INSTRUCTIONS: Students scan and upload answer into Blackboard

Question 1:

Find the rms value of the half-wave rectified sinusoidal voltage shown in Fig1

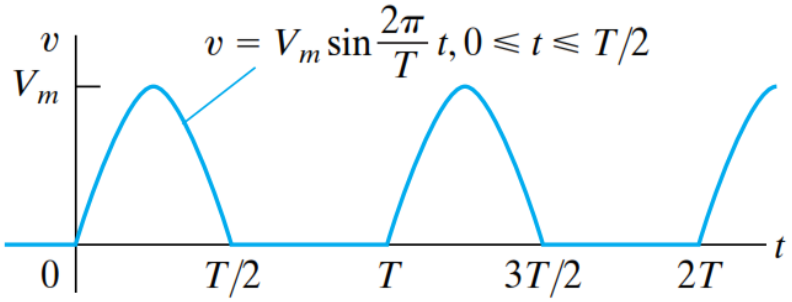


Fig.1

Question 2:

Use the concept of the phasor to combine the following sinusoidal functions into a single trigonometric expression:

a) $y = 30\cos(200t - 160°) + 15\cos(200t + 70°)$,

b) $y = 90\sin(50t - 20°) + 60\cos(200t - 70°)$,

Question 3:

A 400 Hz sinusoidal voltage with a maximum amplitude of 100 V at is applied across the terminals of an inductor. The maximum amplitude of the steady-state current in the inductor is 20 A.

a) What is the frequency of the inductor current?

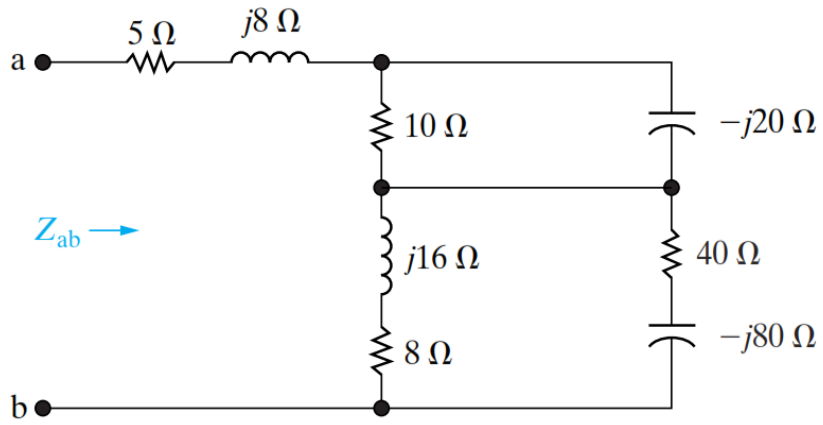
b) If the phase angle of the voltage is zero, what is the phase angle of the current?

c) What is the inductive reactance of the inductor?

d) What is the inductance of the inductor in millihenrys?

e) What is the impedance of the inductor?

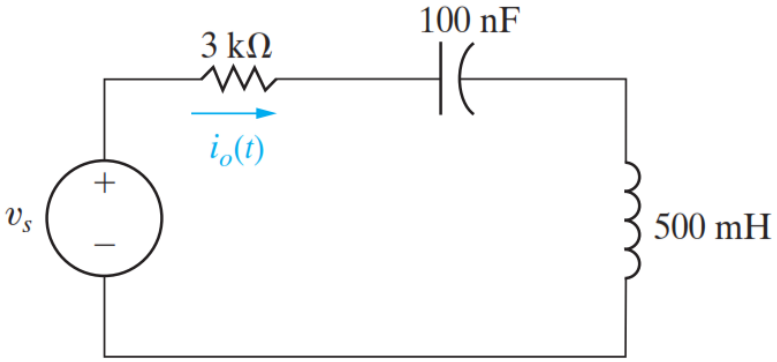
Question 4:



Find the impedance Zab in the circuit in both polar and rectangular form

Question 5:

Find the steady-state expression $i_0(t)$ for in the circuit , vs = 80 cos(2000t) V



Question 6:

Find the steady-state expression $v_0(t)$ for in the circuit , vg = 60 sin(8000t) V