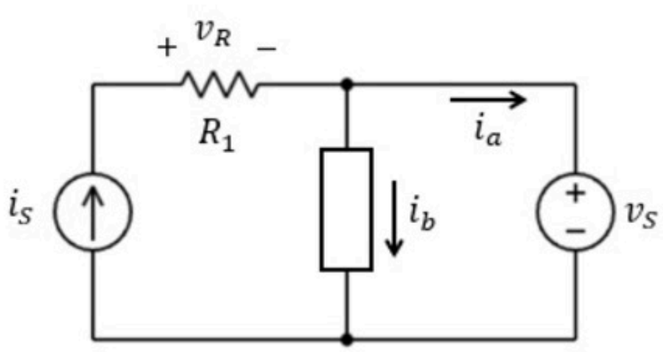
# Phasors 019

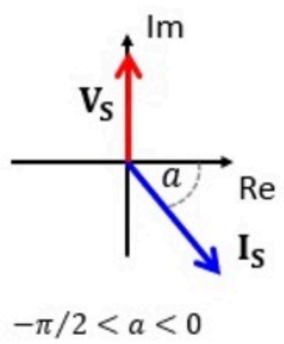
0 of 5 attempts made

The AC circuit below has $\omega = W_1$ and is in steady state. The phasor diagram shows the phasors of $v_S$ and $i_S$. You are given the angle $a$, and vector lengths $|\mathbf{I_S}| = A_1$ and $|\mathbf{V_S}| = A_2\sqrt{b}$. The diagram is not necessarily drawn to scale (but $\mathbf{V_S}$ is along the imaginary axis). The element in the center (rectangular box) is either an inductor or a capacitor but you are not told which.

a. At what time does $v_R$ reach its maximum value? Enter $k = t_0 \cdot \frac{12}{\pi}$, where $t_0$ is the first time that the maximum is reached, for $t_0 \geq 0$. (Hint: convert $a$ to radians first)

b. We select the mystery element such that $|\mathbf{I_a}|$ is minimized (note that this is the current through the voltage source). What is the mystery element type (enter 1 for capacitor, 2 for inductor)? What is its value *X* (i.e., either the capacitance or the inductance value, in F or H respectively)?




$-\pi/2 < a < 0$

Given Variables:

W1 : 4 rad/s
a : -30 degrees
A1 : 1 A
A2 : 10 V
b : 3
R1 : 1 ohm

Calculate the following:

k (s) :

0.5 ✓

Type :

2 ✓

X :

5 ✓