Phasors 005

Unlimited Attempts.

Each voltage-current pair below is the voltage across an element and the current through that element, adhering to the passive sign convention (ω is in units of rad/s).

$$v_1(t) = A_1 \cdot \cos(400t + 25°) \qquad i_1(t) = B_1 \cdot \sin(400t + 25°)$$
$$v_2(t) = A_2 \cdot \sin(500t + 70°) \qquad i_2(t) = B_2 \cdot \sin(500t + 160°)$$
$$v_3(t) = A_3 \cdot \cos(700t + 30°) \qquad i_3(t) = B_3 \cdot \sin(700t + 120°)$$

For each element:

a) Indicate the type of element. Enter 1 for resistor, 2 for inductor, and 3 for capacitor.
b) Find the value of the element. Assume the units are mΩ, mH or mF respectively.

Given Variables:

A1 : 12 V
B1 : 3 A
A2 : 20 V
B2 : 4 A
A3 : 2 V
B3 : 4 A

Calculate the following:

Type 1 (.) :

2 ✓

Value 1 (.) :

10 ✓

Type 2 (.) :

3 ✓

Value 2 (.) :

0.4 ✓

Type 3 (.) :

1 ✓

Value 3 (.) :

500 ✓

Hint: Convert to phasors and check if current lags or leads.