

Phasors 003

Problem has been graded.

Consider the sinusoids:

$$i_1(t) = 12 \cos(10t + A_1)$$

$$i_2(t) = 12 \sin(10t + A_2)$$

The corresponding phasors are:

$$\mathbf{I}_1 = 12e^{jB_1} \quad \text{with } -180^\circ \leq B_1 \leq 180^\circ$$

$$\mathbf{I}_2 = 12e^{jB_2} \quad \text{with } -180^\circ \leq B_2 \leq 180^\circ$$

Find B_1 and B_2 .

Given Variables:

A1 : 35 degrees

A2 : 45 degrees

Calculate the following:

B1 (degrees) :

35



B2 (degrees) :

-45



Hint: Convert the sine to cosine first.

Consider the sinusoids:

$$i_1(t) = 12 \cos(10t + A_1)$$

$$i_2(t) = 12 \sin(10t + A_2)$$

A1 : 55 degrees

A2 : 20 degrees

The corresponding phasors are:

$$I_1 = 12e^{jB_1} \quad \text{with } -180^\circ \leq B_1 \leq 180^\circ$$

$$I_2 = 12e^{jB_2} \quad \text{with } -180^\circ \leq B_2 \leq 180^\circ$$

Find B_1 and B_2 .

$$i_1(t) = 12 \cos(10t + 55^\circ) \Rightarrow I_1 = 12 e^{j55^\circ}$$

$B_1 = 55^\circ$

$$\begin{aligned} i_2(t) &= 12 \sin(10t + 20^\circ) \\ &= 12 \cos(10t + 20^\circ - 90^\circ) \\ &= 12 \cos(10t - 70^\circ) \Rightarrow I_2 = 12 e^{-j70^\circ} \end{aligned}$$

$B_2 = -70^\circ$