Phasors 002

Problem has been graded.

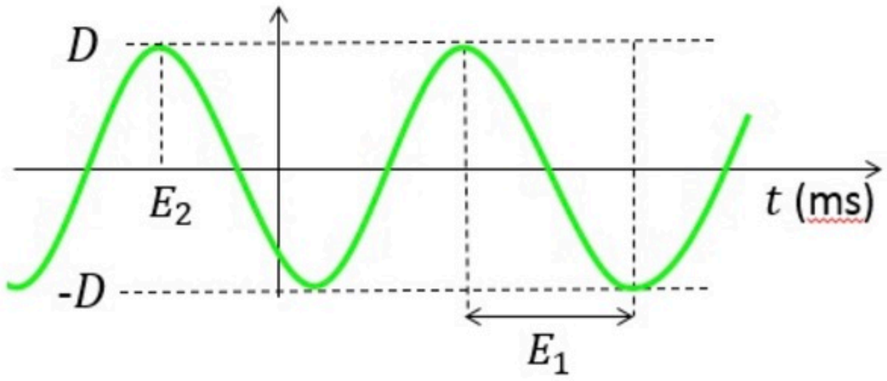
Express the current as a time waveform

$$i(t) = A_1 \cdot \cos(2\pi f_1 \cdot t + B_1)$$

with $0 \leq A_1$ and $-180° \leq B_1 \leq 180°$

and as a phasor

$$\mathbf{I} = A_2 \cdot e^{jB_2} \quad \text{with} \quad 0 \leq A_2 \quad \text{and} \quad -180° \leq B_2 \leq 180°$$



Given Variables:

D : 5 A

E1 : 1 ms

E2 : -0.7 ms

Calculate the following:

f1 (1/s) :

500 ✓

A1 (A) :

5 ✓

B1 (degrees) :

126 ✓

A2 (A) :

5 ✓

B2 (degrees) :

126 ✓

Hint: How does phase relate to time delay?

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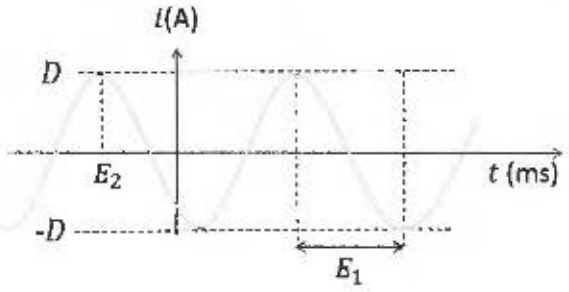
D : 6 A

E1 : 2 ms

E2 : -1.7 ms



$T = 2 \cdot E_1 = 4\ ms \Rightarrow f_1 = \frac{1}{T} = \frac{1000}{4} = 250$

$\boxed{f_1 = 250\ s^{-1}}$

$A_1 = A_2 = D \Rightarrow \boxed{A_1 = 6\ A} \quad \boxed{A_2 = 6\ A}$

$\varphi = -\omega t_0 = -\frac{2\pi}{T} \cdot E_2 = \frac{-2\pi}{4\ ms} \cdot (-1.7\ ms) = \frac{\pi \cdot 1.7}{2}\ rad$

$\varphi = \frac{180° \cdot 1.7}{2} = 90° \cdot 1.7 = (9.17)° = 153°$

$\boxed{B_1 = 153°} \quad \boxed{B_2 = 153°}$