

PP Phasors 001

Unlimited Attempts.

$$v_1(t) = -4 \cdot \cos\left(10t + \frac{\pi}{4}\right) \text{ V}$$

$$v_2(t) = 3 \cdot \sin\left(10t + \frac{\pi}{3}\right) \text{ V}$$

Express as phasors

$$\mathbf{V}_1 = A_1 \cdot e^{jB_1} \quad \text{with} \quad 0 \leq A_1 \quad \text{and} \quad -180^\circ \leq B_1 \leq 180^\circ$$

$$\mathbf{V}_2 = A_2 \cdot e^{jB_2} \quad \text{with} \quad 0 \leq A_2 \quad \text{and} \quad -180^\circ \leq B_2 \leq 180^\circ$$

Given Variables:

...

Calculate the following:

A1 (V) :

4



B1 (degrees) :

-135



A2 (V) :

3



B2 (degrees) :

-30



Hint: Convert sin() to cos() first

PP Phasors 002

Unlimited Attempts.

$$\mathbf{V}_1 = 5 \cdot e^{j\frac{\pi}{6}}$$

$$\mathbf{V}_2 = 5 \cdot e^{j\frac{5\pi}{6}}$$

$$\mathbf{V}_3 = 6 \cdot e^{-j\frac{\pi}{2}}$$

Find

$$\mathbf{X} = a + jb = \mathbf{V}_1 + \mathbf{V}_2 + \mathbf{V}_3$$

Given Variables:

...

Calculate the following:

a (.) :

0



b (.) :

-1



Hint: Draw the vectors.

PP Phasors 003

Unlimited Attempts.

$$\mathbf{V}_1 = 7 \cdot e^{j\frac{\pi}{4}}$$

$$\mathbf{V}_2 = 7 \cdot e^{j\frac{11\pi}{12}}$$

$$\mathbf{V}_3 = 7 \cdot e^{j\frac{7\pi}{12}}$$

Find

$$\mathbf{X} = a + jb = \mathbf{V}_1 + \mathbf{V}_2 - \mathbf{V}_3$$

Given Variables:

. . . .

Calculate the following:

a (.) :

0



b (.) :

0



PP Phasors 004

Unlimited Attempts.

$$v(t) = 2\sqrt{2} \cdot \cos\left(10t + \frac{\pi}{6}\right) + 2\sqrt{2} \cdot \sin\left(10t + \frac{7\pi}{6}\right) \quad \text{V}$$

Express

$$v(t) = A \cdot \cos(10t + B) \quad \text{with} \quad 0 \leq A \quad \text{and} \quad -180^\circ \leq B \leq 180^\circ$$

Given Variables:

...

Calculate the following:

A (V) :

4



B (degrees) :

75



Hint: Convert to phasors; do the algebra in the complex domain (mostly in polar coordinates).

PP Phasors 005

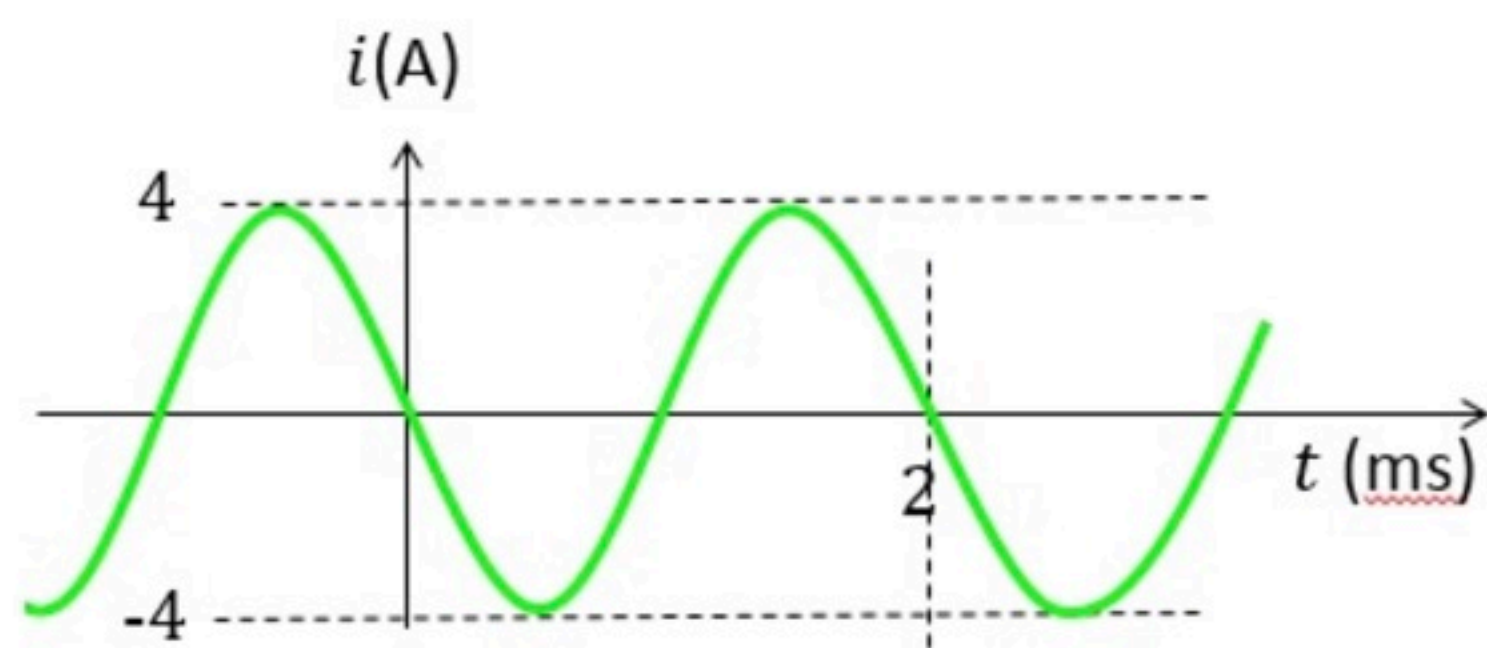
Unlimited Attempts.

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 $-180^\circ \leq B_1 \leq 180^\circ$

and as a phasor

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



Given Variables:

. . .

Calculate the following:

A1 (A) :

4



f1 (1/s) :

500



B1 (degrees) :

90



A2 (A) :

4



B2 (degrees) :

90



PP Phasors 006

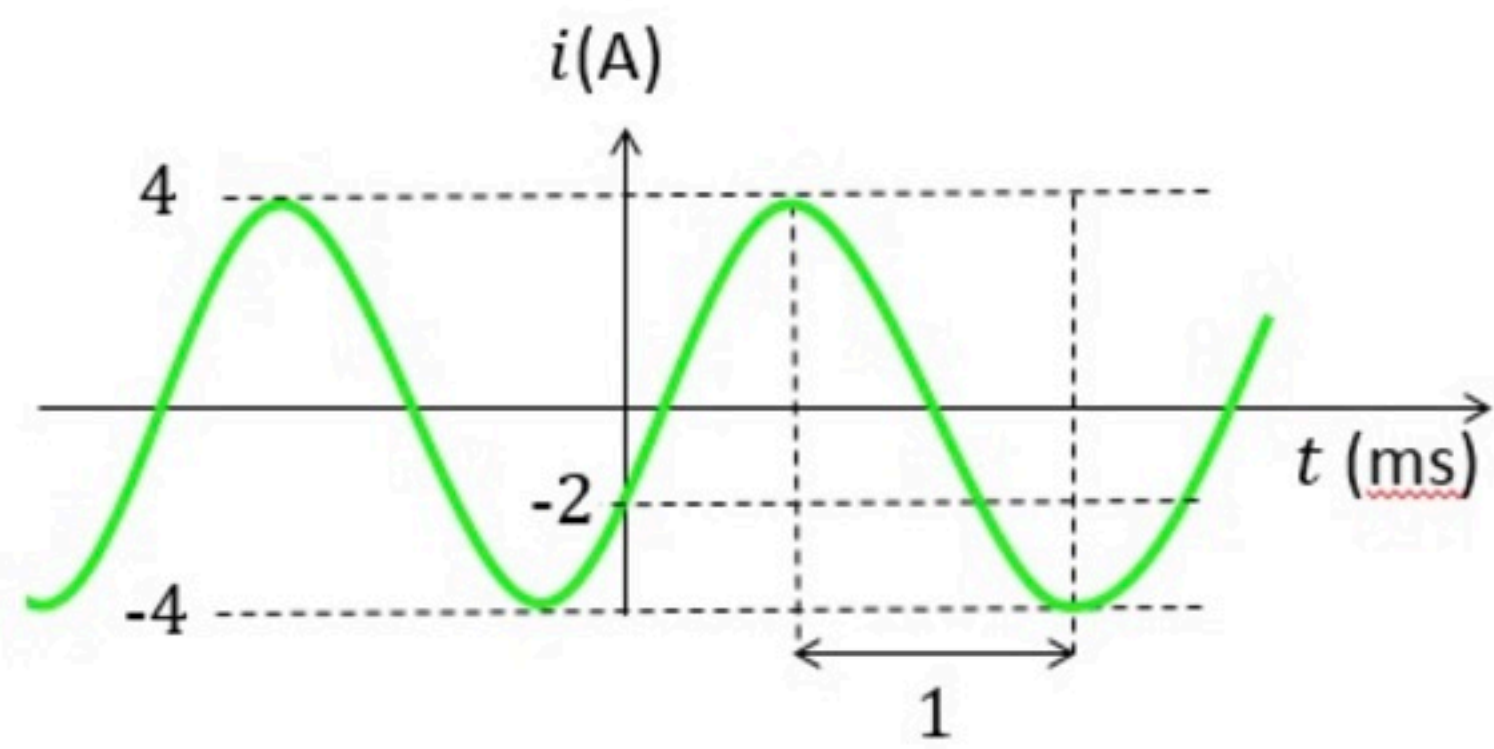
Unlimited Attempts.

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 $-180^\circ \leq B_1 \leq 180^\circ$

and as a phasor

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



Given Variables:

...

Calculate the following:

A1 (A) :

4



f1 (1/s) :

500



B1 (degrees) :

-120



A2 (A) :

4



B2 (degrees) :

-120



Hint: Can we find the phase on the graph?

PP Phasors 007

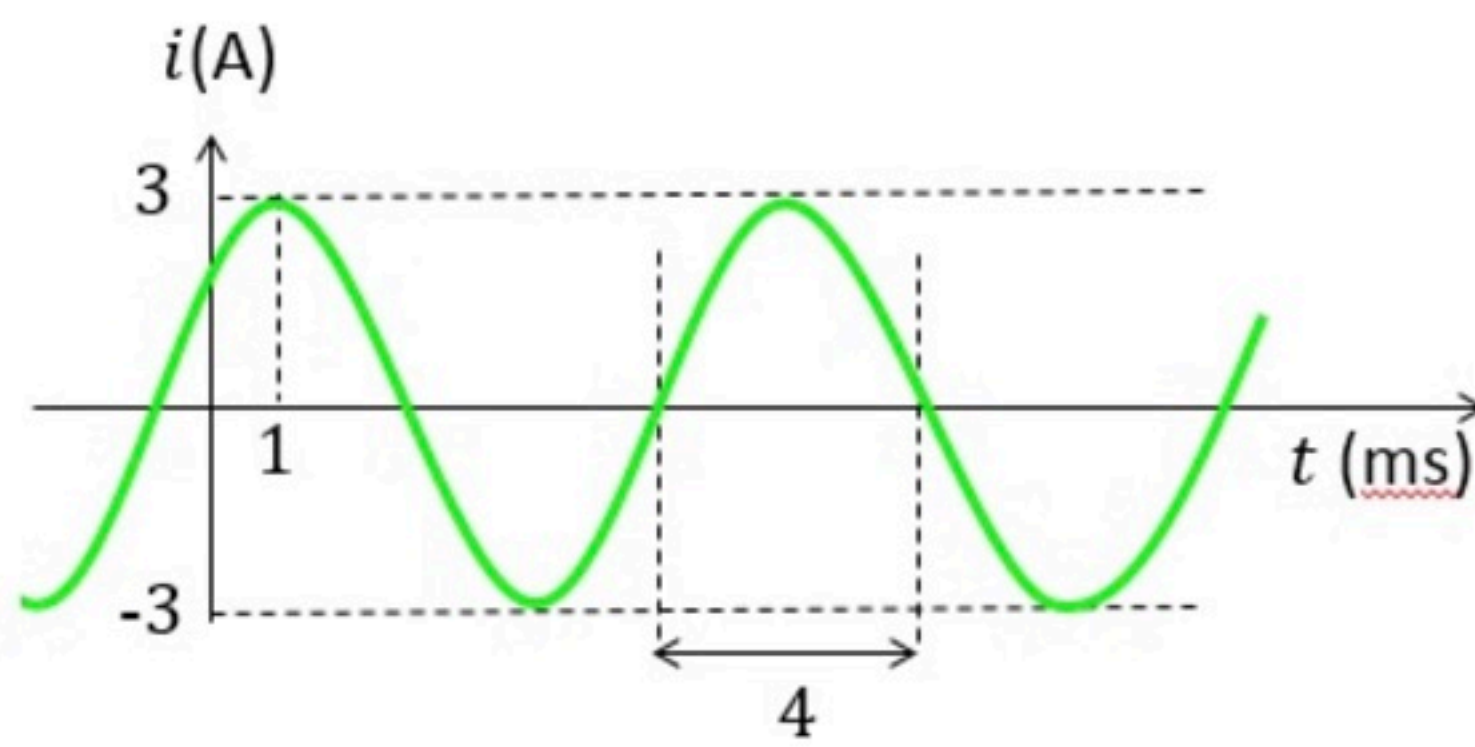
Unlimited Attempts.

Express the current as a time waveform

$$i(t) = A_1 \cdot \cos(2\pi f_1 \cdot t + B_1) \quad \text{with} \quad 0 \leq A_1 \quad \text{and} \quad -180^\circ \leq B_1 \leq 180^\circ$$

and as a phasor

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



Given Variables:

...

Calculate the following:

A1 (A) :

3



f1 (1/s) :

125



B1 (degrees) :

-45



A2 (A) :

3



B2 (degrees) :

-45



Hint: How does phase relates to time delay?

PP Phasors 008

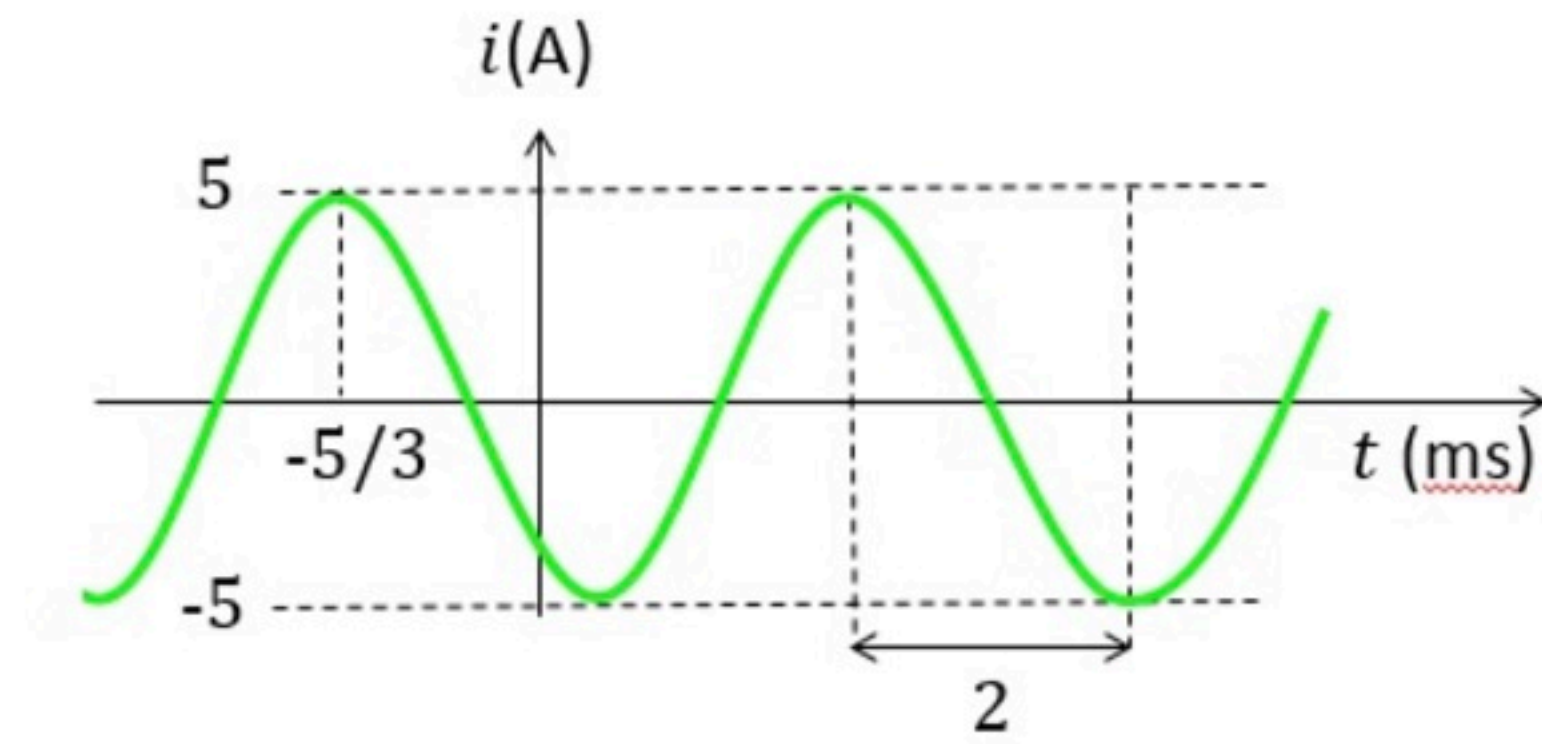
Unlimited Attempts.

Express the current as a time waveform

$$i(t) = A_1 \cdot \cos(2\pi f_1 \cdot t + B_1) \quad \text{with} \quad 0 \leq A_1 \quad \text{and} \quad -180^\circ \leq B_1 \leq 180^\circ$$

and as a phasor

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



Given Variables:

. . .

Calculate the following:

A1 (A) :

5

✓

f1 (1/s) :

250

✓

B1 (degrees) :

150

✓

A2 (A) :

5

✓

B2 (degrees) :

150

✓

Hint: How does phase relates to time delay?

PP Phasors 009

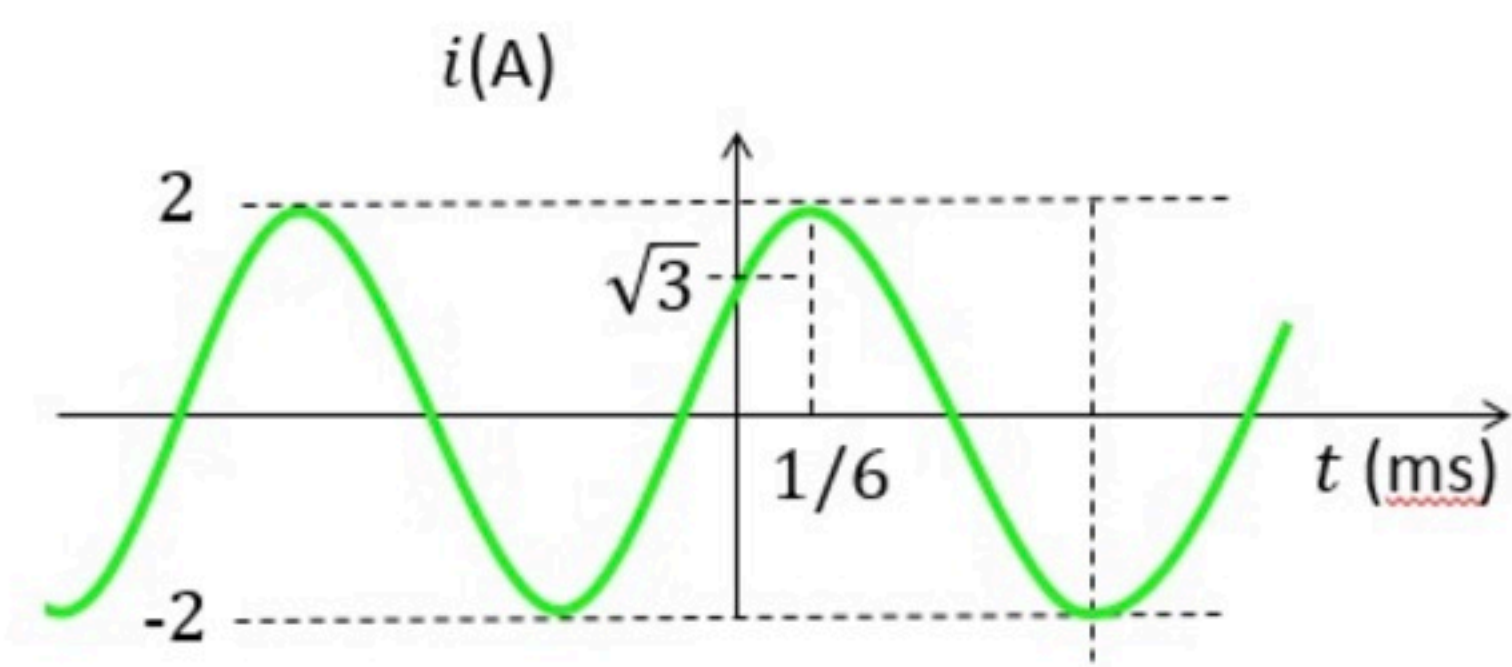
Unlimited Attempts.

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 $-180^\circ \leq B_1 \leq 180^\circ$

and as a phasor

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



Given Variables:

...

Calculate the following:

A1 (A) :

2 ✓

f1 (1/s) :

500 ✓

B1 (degrees) :

-30 ✓

A2 (A) :

2 ✓

B2 (degrees) :

-30 ✓

Hint: How does phase relates to time delay?

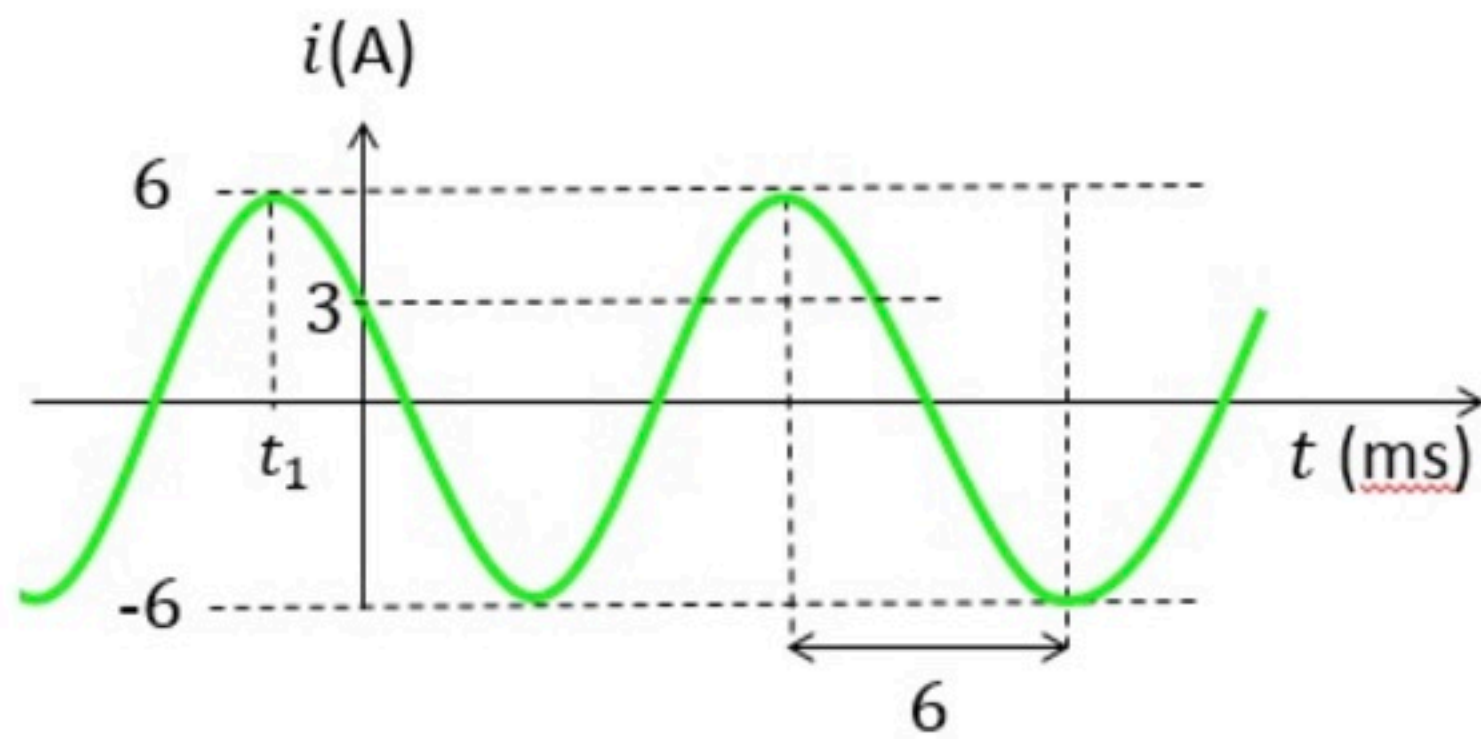
PP Phasors 010

Unlimited Attempts.

Find t_1 .

Express the current as a phasor

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



Given Variables:

...

Calculate the following:

t_1 (ms) :

-2



A_2 (A) :

6



B_2 (degrees) :

60



Hint: Can we find the phase on the graph?