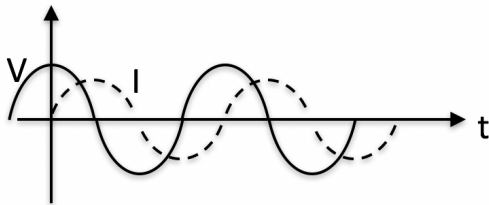What is $Re\left[\frac{e^{i\omega t}}{1+i}\right]$?

A. $\frac{1}{\sqrt{2}}\cos(\omega t + \pi/4)$

B. $\frac{1}{\sqrt{2}}\cos(\omega t - \pi/4)$

C. $\frac{1}{2}\cos(\omega t + \pi/4)$

D. $\frac{1}{2}\cos(\omega t - \pi/4)$

E. Something else

AC voltage V and current I vs time t are as shown:

The graph shows that..

A. I leads V (I peaks before V peaks)

B. I lags V (I peaks after V peaks)

C. Neither

Suppose you have a circuit driven by a voltage:
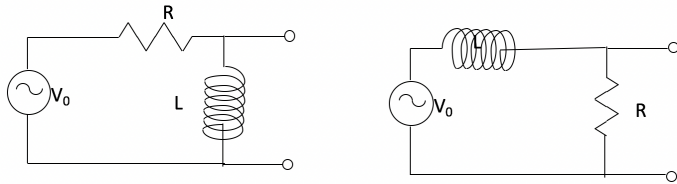$$V(t) = V_0 \cos(\omega t)$$

You observe the resulting current is:
$$I(t) = I_0 \cos(\omega t - \pi/4)$$

Would you say the current is
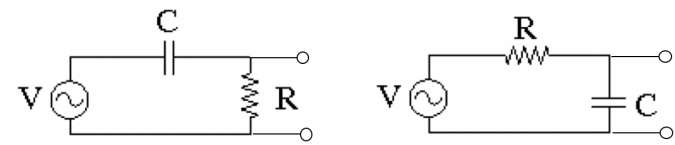
A. leading

B. lagging

the voltage by 45 degrees?

Two LR circuits driven by an AC power supply are shown below.

Which circuit is a low pass filter?

A. The left circuit
B. The right circuit
C. Both circuits
D. Neither circuit

Two RC circuits driven by an AC power supply are shown below.

Which circuit is a high pass filter?

A. The left circuit
B. The right circuit
C. Both circuits
D. Neither circuit