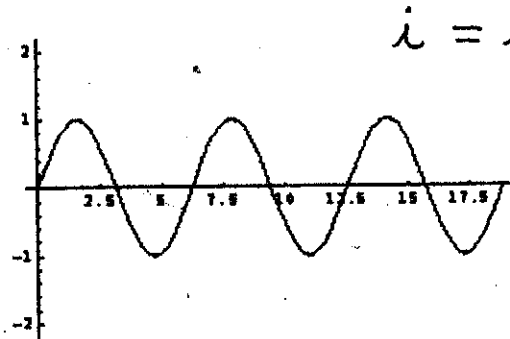


March 27, 2007

Quiz 17

Name (print): SOLUTION

In an LC circuit the switch is closed at $t=0$ and the current oscillates as shown.



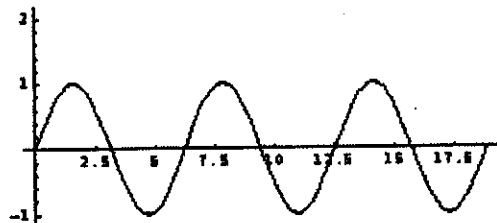
$$i = i_0 \sin[\omega_{LC} t]$$

$$\omega_{LC} = \frac{1}{\sqrt{LC}}$$

$$\omega_{LC} \rightarrow \frac{1}{\sqrt{2L2C}} = \frac{1}{2} \omega_{LC}$$

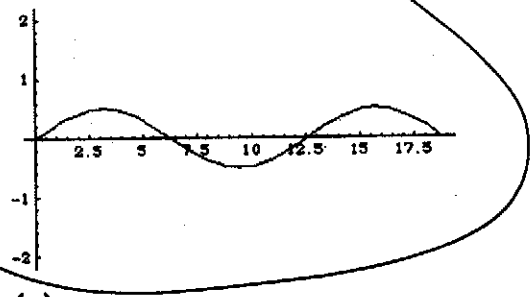
I now *double* the value L of the inductor and also double the value C for the capacitor. Which plot below corresponds to the new oscillating current?

(a)

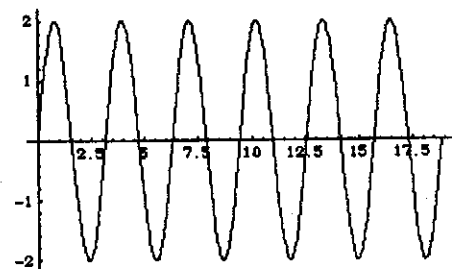


New frequency oscillates $\frac{1}{2}$ as fast as old one.

(b)



(c)

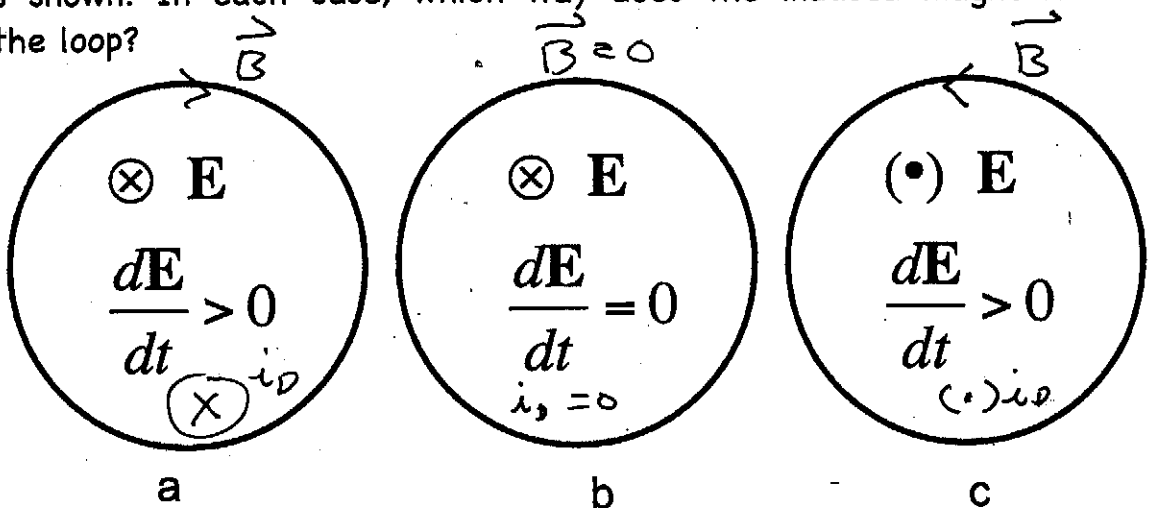


March 29, 2007

Quiz 18

Name (print): SOLUTION

Alice, Bob, and Charlie have three loops of plastic with changing electric fields in them as shown. In each case, which way does the induced magnetic field run around the loop?



$$i_D \propto \frac{dE}{dt} > 0$$

$$i_D \propto \frac{dE}{dt} = 0$$

$$i_D \propto \frac{dE}{dt} > 0$$

Circle one each for clockwise (CW), counterclockwise (CCW), or no magnetic field (NONE):

- | | | | |
|-----|-----------|------------|-------------|
| (a) | <u>CW</u> | CCW | NONE |
| (b) | CW | CCW | <u>NONE</u> |
| (c) | CW | <u>CCW</u> | NONE |