Physics 12 Daily Review
Section 21-2

1.

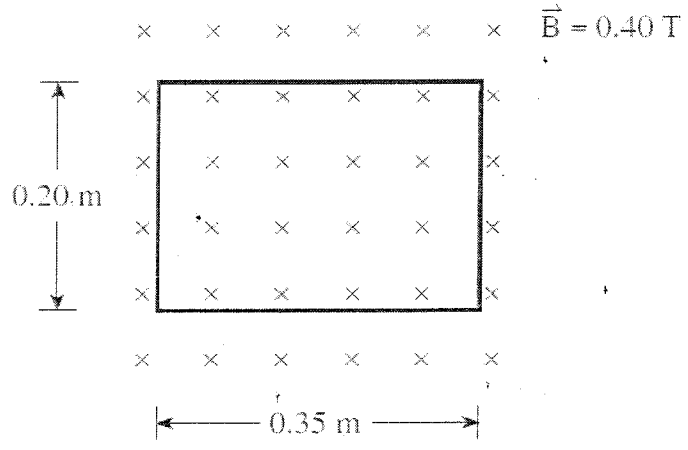
The circular loop of wire shown below has an area of $0.40\ m^2$ and is in a 0.60 T magnetic field. This field is increased to 1.40 T in 0.25 s.

Determine the emf produced in the loop and the direction of current.

	EMF (V)	DIRECTION OF CURRENT
A.	1.3 V	clockwise
B.	1.3 V	counter-clockwise
C.	3.2 V	clockwise
D.	3.2 V	counter-clockwise

2.

A rectangular loop of wire is placed in a magnetic field as shown in the diagram.



If the loop is removed from the field in a time of 0.050 s, what is the induced emf?

A. 0.028 V
B. 0.28 V
C. 0.56 V
D. 5.7 V

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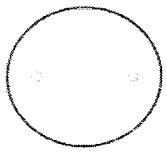
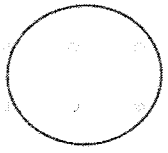


$\vec{B}_i = 0.60$ T



$\vec{B}_f = 1.40$ T

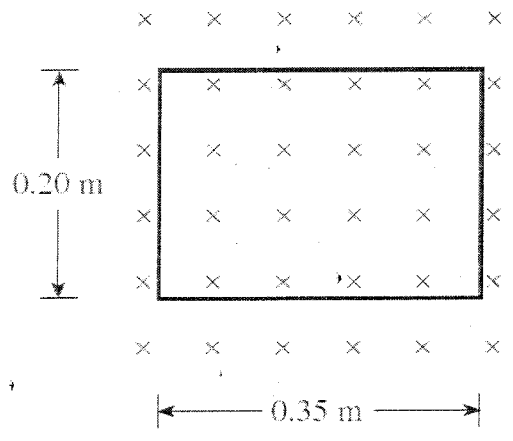
$$\mathcal{E} = -N\frac{\Delta\Phi}{\Delta t}$$
$$= -\frac{(BA_f - BA_i)}{\Delta t}$$
$$= \frac{BA_i - BA_f}{\Delta t}$$
$$= \frac{A(B_i - B_f)}{\Delta t}$$
$$= \frac{0.40(.6 - 1.4)}{.25}$$
$$= -1.3\ V$$

Determine the emf produced in the loop and the direction of current.

	EMF (V)	DIRECTION OF CURRENT
A.	1.3 V	clockwise ←
B.	1.3 V	counter-clockwise
C.	3.2 V	clockwise ←
D.	3.2 V	counter-clockwise

2.

A rectangular loop of wire is placed in a magnetic field as shown in the diagram.



$$\mathcal{E} = -N\frac{\Delta\Phi}{\Delta t}$$
$$= -1\left(\frac{BA_f - BA_i}{\Delta t}\right)$$
$$= \frac{-1 \times (.20 \times .35)(0 - 0.4)}{0.05}$$
$$= 0.56\ V$$

If the loop is removed from the field in a time of 0.050 s, what is the induced emf?

A. 0.028 V
B. 0.28 V
C. 0.56 V
D. 5.7 V