A circular loop of wire is in a region of spatially uniform magnetic field. The magnetic field is directed into the plane of the figure. If the magnetic field magnitude is constant,

A. the induced emf is clockwise.
B. the induced emf is counterclockwise.
C. the induced emf is zero.
D. The answer depends on the strength of the field.
A circular loop of wire is in a region of spatially uniform magnetic field. The magnetic field is directed into the plane of the figure. If the magnetic field magnitude is constant,

A. the induced emf is clockwise.
B. the induced emf is counterclockwise.
✓ C. the induced emf is zero.
D. The answer depends on the strength of the field.
Q29.2

A circular loop of wire is in a region of spatially uniform magnetic field. The magnetic field is directed into the plane of the figure. If the magnetic field magnitude is increasing,

A. the induced emf is clockwise.
B. the induced emf is counterclockwise.
C. the induced emf is zero.
D. The answer depends on the strength of the field.
A circular loop of wire is in a region of spatially uniform magnetic field. The magnetic field is directed into the plane of the figure. If the magnetic field magnitude is increasing,

A. the induced emf is clockwise.

✓ B. the induced emf is counterclockwise.

C. the induced emf is zero.

D. The answer depends on the strength of the field.
A circular loop of wire is placed next to a long straight wire. The current $I$ in the long straight wire is *increasing*. What current does this induce in the circular loop?

A. a clockwise current
B. a counterclockwise current
C. zero current
D. not enough information given to decide
A circular loop of wire is placed next to a long straight wire. The current $I$ in the long straight wire is increasing. What current does this induce in the circular loop?

A. a clockwise current
B. a counterclockwise current
C. zero current
D. not enough information given to decide
A circular loop of wire is placed next to a long straight wire. The current $I$ in the long straight wire is *increasing*. The circular loop will be

A. attracted to the long wire
B. repelled away from the long wire
C. neither attract nor repel
D. not enough information given to decide
A circular loop of wire is placed next to a long straight wire. The current $I$ in the long straight wire is *increasing*. The circular loop will be

A. attracted to the long wire  
B. repelled away from the long wire  
C. neither attract nor repel  
D. not enough information given to decide
A circular loop of wire is placed next to a long straight wire. The current $I$ in the long straight wire is *decreasing*. The circular loop will be

A. attracted to the long wire and the induced current is clockwise

B. repelled away from the long wire and the induced current is counterclockwise

C. attracted to the long wire and the induced current is counterclockwise

D. repelled away from the long wire and the induced current is clockwise
A circular loop of wire is placed next to a long straight wire. The current $I$ in the long straight wire is \textit{decreasing}. The circular loop will be

A. attracted to the long wire and the induced current is clockwise

B. repelled away from the long wire and the induced current is counterclockwise

C. attracted to the long wire and the induced current is counterclockwise

D. repelled away from the long wire and the induced current is clockwise

\[ \checkmark \text{C. attracted to the long wire and the induced current is counterclockwise} \]
A flexible loop of wire lies in a uniform magnetic field of magnitude $B$ directed into the plane of the picture. The loop is pulled as shown, reducing its area. The induced current

A. flows downward through resistor $R$ and is proportional to $B$.
B. flows upward through resistor $R$ and is proportional to $B$.
C. flows downward through resistor $R$ and is proportional to $B^2$.
D. flows upward through resistor $R$ and is proportional to $B^2$.
E. none of the above
A flexible loop of wire lies in a uniform magnetic field of magnitude $B$ directed into the plane of the picture. The loop is pulled as shown, reducing its area. The induced current

A. flows downward through resistor $R$ and is proportional to $B$.

B. flows upward through resistor $R$ and is proportional to $B$.

C. flows downward through resistor $R$ and is proportional to $B^2$.

D. flows upward through resistor $R$ and is proportional to $B^2$.

E. none of the above
The rectangular loop of wire is being moved to the right at constant velocity. A constant current \( I \) flows in the long straight wire in the direction shown. The current induced in the loop is

A. clockwise and proportional to \( I \).

B. counterclockwise and proportional to \( I \).

C. clockwise and proportional to \( I^2 \).

D. counterclockwise and proportional to \( I^2 \).

E. zero.
The rectangular loop of wire is being moved to the right at constant velocity. A constant current $I$ flows in the long straight wire in the direction shown. The current induced in the loop is

A. clockwise and proportional to $I$.

B. counterclockwise and proportional to $I$.

C. clockwise and proportional to $I^2$.

D. counterclockwise and proportional to $I^2$.

E. zero.
Q29.8

The loop of wire is being moved to the right at constant velocity. A constant current $I$ flows in the long straight wire in the direction shown. The current induced in the loop is

A. clockwise and proportional to $I$.
B. counterclockwise and proportional to $I$.
C. clockwise and proportional to $I^2$.
D. counterclockwise and proportional to $I^2$.
E. zero.
The loop of wire is being moved to the right at constant velocity. A constant current $I$ flows in the long straight wire in the direction shown. The current induced in the loop is

A. clockwise and proportional to $I$.
B. counterclockwise and proportional to $I$.
C. clockwise and proportional to $I^2$.
D. counterclockwise and proportional to $I^2$.
E. zero.
Q29.9

The drawing shows the uniform magnetic field inside a long, straight solenoid. The field is directed into the plane of the drawing, and is increasing.

What is the direction of the electric force on a positive point charge placed at point \(a\)?

A. to the left  
B. to the right  
C. straight up  
D. straight down  
E. misleading question — the electric force at this point is zero
The drawing shows the uniform magnetic field inside a long, straight solenoid. The field is directed into the plane of the drawing, and is increasing.

What is the direction of the electric force on a positive point charge placed at point $a$?

A. to the left  
B. to the right  
C. straight up  
D. straight down  
E. misleading question — the electric force at this point is zero
Q29.10

The drawing shows the uniform magnetic field inside a long, straight solenoid. The field is directed into the plane of the drawing, and is increasing.

What is the direction of the electric force on a positive point charge placed at point $b$?

A. to the left  
B. to the right  
C. straight up  
D. straight down  
E. misleading question — the electric force at this point is zero
A29.10

The drawing shows the uniform magnetic field inside a long, straight solenoid. The field is directed into the plane of the drawing, and is increasing.

What is the direction of the electric force on a positive point charge placed at point $b$?

A. to the left
B. to the right
C. straight up
D. straight down
E. misleading question — the electric force at this point is zero

\[ \vec{B} \]
Q29.11

The drawing shows the uniform magnetic field inside a long, straight solenoid. The field is directed into the plane of the drawing, and is increasing.

What is the direction of the electric force on a positive point charge placed at point c (at the center of the solenoid)?

A. to the left  
B. to the right

C. straight up  
D. straight down

E. misleading question — the electric force at this point is zero
The drawing shows the uniform magnetic field inside a long, straight solenoid. The field is directed into the plane of the drawing, and is increasing.

What is the direction of the electric force on a positive point charge placed at point \( c \) (at the center of the solenoid)?

A. to the left          B. to the right
C. straight up          D. straight down

E. misleading question — the electric force at this point is zero