

AP Physics 2

Name: _____ Score: _____

1. Two north poles are brought together. They:
 - ☐ attract
 - ☐ repel
 - ☐ merge into one pole
 - ☐ do nothing
2. A 2 C charge moves at $3 \frac{\text{m}}{\text{s}}$ across a 4 T field (right angles). What force does it feel, in N?
_____ N
3. A 0.5 m wire carries 4 A across a 2 T field. What force does it feel, in N?
_____ N
4. A 100-turn coil has its flux change by 0.02 Wb in 0.5 s. What is the size of the induced EMF, in V?
_____ V
5. Outside a magnet, field lines point:
 - ☐ from north to south
 - ☐ from south to north
 - ☐ straight up
 - ☐ randomly
6. The magnetic force on a moving charge is directed:
 - ☐ along the field
 - ☐ perpendicular to both velocity and field
 - ☐ opposite the velocity
 - ☐ along the velocity
7. The force on a current-carrying wire in a magnetic field is:
 - ☐ $F = qvB$
 - ☐ $F = ma$ only
 - ☐ $F = IR$
 - ☐ $F = BIL$
8. What is needed to induce a voltage in a coil?

- ☐ a large resistance
- ☐ a changing magnetic flux
- ☐ a steady magnetic field
- ☐ a stationary magnet inside it

9. You can cut a bar magnet to obtain a single, isolated north pole.

- ☐ True ☐ False

10. A stationary charge in a magnetic field feels the maximum magnetic force.

- ☐ True ☐ False

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1. **repel**

Like poles repel, just as like charges do.

2. **24 N**

$$F = qvB = 2 \times 3 \times 4 = 24 \text{ N.}$$

3. **4 N**

$$F = BIL = 2 \times 4 \times 0.5 = 4 \text{ N.}$$

4. **4 V**

$$|\varepsilon| = N\Delta\Phi/\Delta t = 100 \times 0.02/0.5 = 4 \text{ V.}$$

5. **from north to south**

Outside a magnet, field lines run from the north pole to the south pole.

6. **perpendicular to both velocity and field**

The force is perpendicular to both the velocity and the field.

7. **$F = BIL$**

$F = BIL$ – the motor-effect force on a current.

8. **a changing magnetic flux**

Only a changing flux induces an EMF; a steady field does nothing.

9. **False**

Poles always come in pairs; each piece of a cut magnet has both N and S.

10. **False**

False. The magnetic force needs motion: $F = qvB \sin \theta$ is zero when $v = 0$.