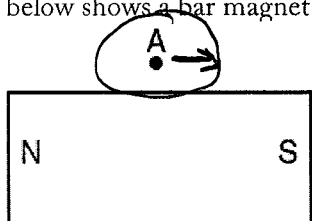


Magnetism

- In order to produce a magnetic field, an electric charge must be
 - stationary
 - moving
 - positive
 - negative
- The diagram below shows a bar magnet.

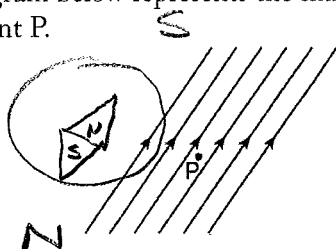


What is the direction of a compass needle placed at point A?

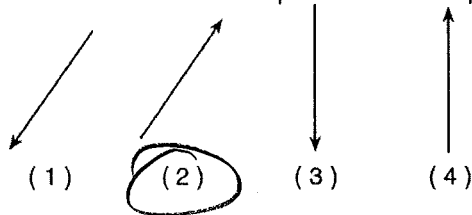
- up
- down
- right
- left

↑
ARROW
IS A
N POLE

- The diagram below represents the magnetic field near point P.



If a compass is placed at point P in the same plane as the magnetic field, which arrow represents the direction the north end of the compass needle will point?

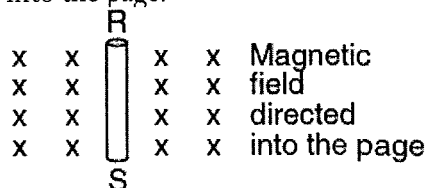


- Which type of field is present near a moving electric charge?
 - an electric field, only
 - a magnetic field, only
 - both an electric field and a magnetic field
 - neither an electric field nor a magnetic field

- A student is given two pieces of iron and told to determine if one or both of the pieces are magnets. First, the student touches an end of one piece to one end of the other. The two pieces of iron attract. Next, the student reverses one of the pieces and again touches the ends together. The two pieces attract again. What does the student definitely know about the initial magnetic properties of the two pieces of iron?

ONLY ONE OF THE PIECES ARE
MAGNETIC - IF THEY BOTH
WERE MAGNETIC, THEY COULD NOT
BE ATTRACTED ON BOTH ENDS

- The diagram below represents a wire conductor, RS, positioned perpendicular to a uniform magnetic field directed into the page.

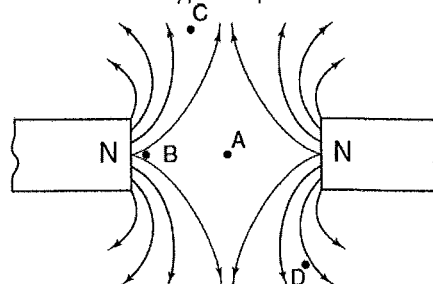


Describe the direction in which the wire could be moved to produce the maximum potential difference across its ends, R and S.

(CURRENT)

MOVE THE WIRE TO THE
RIGHT (OR LEFT) PERPENDICULAR
TO THE MAGNETIC FIELD

- The diagram below shows the lines of magnetic force between two north magnetic poles.

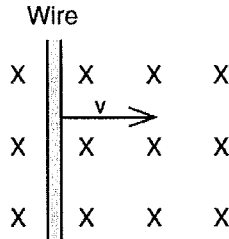


At which point is the magnetic field strength greatest?

- A
- B
- C
- D

Magnetism

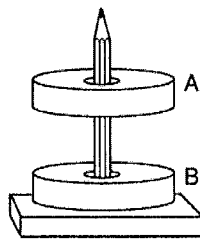
8. The diagram below shows a wire moving to the right at speed v through a uniform magnetic field that is directed into the page.



Magnetic field directed into page

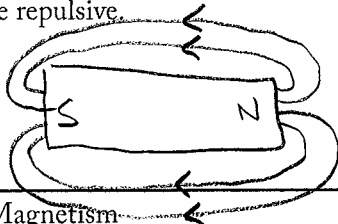
As the speed of the wire is increased, the induced potential difference will

1. decrease
 2. increase
 3. remain the same
9. Which is *not* a vector quantity?
1. electric charge
 2. magnetic field strength
 3. velocity
 4. displacement
10. When two ring magnets are placed on a pencil, magnet A remains suspended above magnet B, as shown below.



Which statement describes the gravitational force and the magnetic force acting on magnet A due to magnet B?

1. The gravitational force is attractive and the magnetic force is repulsive.
2. The gravitational force is repulsive and the magnetic force is attractive.
3. Both the gravitational force and the magnetic force are attractive.
4. Both the gravitational force and the magnetic force are repulsive.

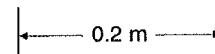
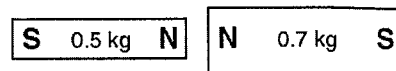


11. Moving a length of copper wire through a magnetic field may cause the wire to have a
1. potential difference across it
 2. lower temperature
 3. lower resistivity
 4. higher resistance
12. The diagram below shows the magnetic field lines between two magnetic poles, A and B.



Which statement describes the polarity of magnetic poles A and B?

1. A is a north pole and B is a south pole.
 2. A is a south pole and B is a north pole.
 3. Both A and B are north poles.
 4. Both A and B are south poles.
13. Magnetic fields are produced by particles that are
1. moving and charged
 2. moving and neutral
 3. stationary and charged
 4. stationary and neutral
14. The diagram below represents a 0.5-kilogram bar magnet and a 0.7-kilogram bar magnet with a distance of 0.2 meter between their centers.



Which statement best describes the forces between the bar magnets?

1. Gravitational force and magnetic force are both repulsive
 2. Gravitational force is repulsive and magnetic force is attractive.
 3. Gravitational force is attractive and magnetic force is repulsive.
 4. Gravitational force and magnetic force are both attractive.
15. Draw a diagram of a bar magnet, with a minimum of four field lines to show the magnitude and direction of the magnetic field in the region surrounding the bar magnet.

Name: _____

Score: _____

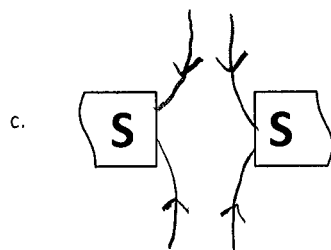
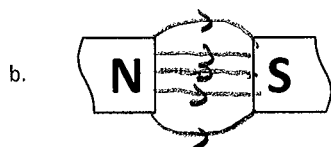
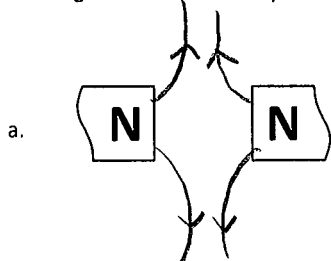
10

Regents Physics

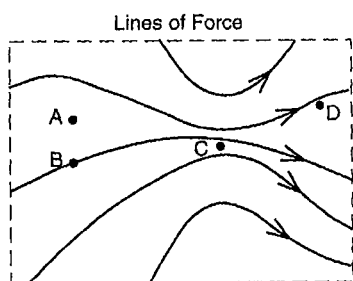
Worksheet 4.3.1 – Magnetism (10 points)

Show all work – multiple choice answers MUST be proven for full credit!

1. Sketch the magnetic field in each system.



2. The diagram below represents magnetic lines of force within a region of space.



The magnetic field is strongest at point

- (1) A
- (2) B

- (3) C
- (4) D

Proof: Explain your reasoning.

FIELD LINES ARE CLOSEST TO EACH OTHER

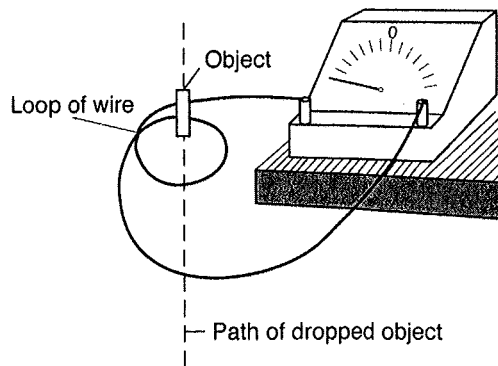
3. Which type of field is present near a moving electric charge?

- (1) electric field only
- (2) magnetic field only
- (3) both electric and magnetic fields
- (4) neither electric nor magnetic fields

Proof: Explain your reasoning.

MOVING CHARGED PARTICLES CREATE A MAGNETIC FIELD

4. A small object is dropped through a loop of wire connected to a sensitive ammeter on the edge of a table as shown in the diagram below.



A reading on the ammeter is most likely produced when the object falling through the loop of the wire is a

- (1) flashlight battery
- (2) bar magnet
- (3) brass mass
- (4) plastic ruler

Proof: Explain your reasoning.

MOVING A MAGNET IN A LOOP OF WIRE INDUCES A POTENTIAL DIFFERENCE/CURRENT