Topic 5.4 – Magnetic fields **Formative Assessment**

NAME: _____ TEAM:__

THIS IS A PRACTICE ASSESSMENT. Show formulas, substitutions, answers (in spaces provided) and units!

1. State the pole law, and compare and contrast it with the charge law. _____
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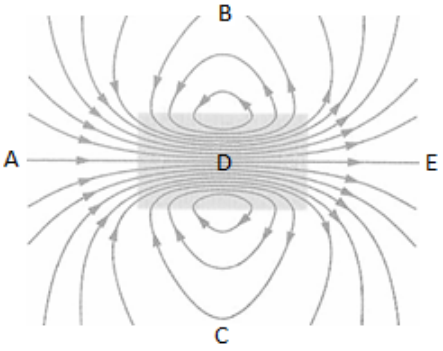
_____
_____
_____

2. Sketch in a compass needle 

at the labeled points surrounding the pictured bar magnet. 2.__In figure___



3. Compare and contrast a magnetic dipole and an electric dipole. Include a sketch of both. _____
_____
_____.

4. The current is traveling from right to left in the wire pictured here. Using dots and ×s, sketch in the magnetic field surrounding the wire. What happens to the field when the current is turned off? Explain how the right hand rule works. _____

_____
_____
_____.

5. A magnetic field created by a current in a straight wire surrounds the wire as shown. State the direction of the current, and explain how the right hand rule works. _____. _____

_____
_____.

6. What is the strength of the magnetic field 4.75 cm from the wire if the current is 25.0 A?
6._____

7. What is the strength of the magnetic field at the center of a loop having a radius of 4.75 cm if the current is 25.0 A? 7._____

8. Sketch the magnetic field lines in the solenoid shown here. Assume the current enters on the top and exits on the bottom. Explain how the right hand rule works.

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_____.

9. A straight wire is located in an external magnetic field as shown to the right. If a current is directed upward through the wire, which way will the magnetic force cause the wire to curve? Why? _____. _____
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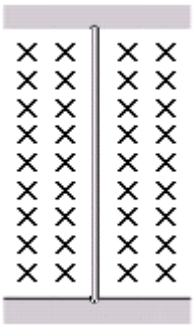
_____
_____.



10. A current-carrying loop of wire is placed in a uniform external magnetic field as shown. If the current in the wire is traveling clockwise in the picture, what do you predict the loop will do when released? Why? _____
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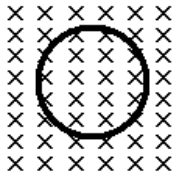
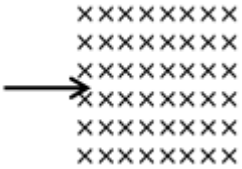
_____
_____.



11. A +48.0 μC charge having a velocity of 8.25×10^{6} ms^{-1} enters an external magnetic field having a magnetic flux density of 1.75 T. Find the magnitude of the magnetic force acting on the charge as it is in the field. Sketch in the direction that the charge will follow as it passes through the field. Explain how the right hand rule works. What will its speed be when it exits the field?



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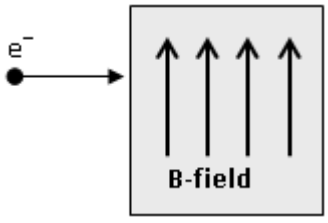
_____.

12. If the current in the 15-cm long wire of problem 9 is 25 A, and the magnetic field strength is 0.85 T, find the magnitude and the direction of the magnetic force acting on the wire.

12._____

13. An electron enters a region of magnetic field as shown. Which way will it be deflected? 13. _____



14. The diagram shows three parallel wires P, Q, and R, each having the same current *I*. The resultant force on wire Q due to wire P and wire R is
    A. perpendicular and into the plane of the paper.
    B. perpendicular and out of the plane of the paper.
    C. in the plane of the paper and to the right.
    D. in the plane of the paper and to the left.