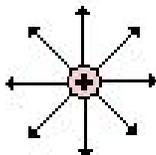


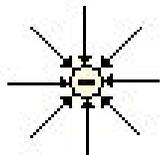
HW# Electric Field Lines Worksheet

1. Several electric field line patterns are shown in the diagrams below. Which of these patterns are incorrect? \_\_\_\_\_ Explain what is wrong with all incorrect diagrams.

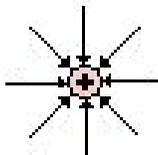
**Diagram A**



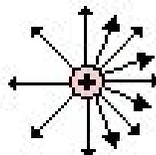
**Diagram B**



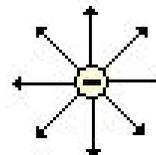
**Diagram C**



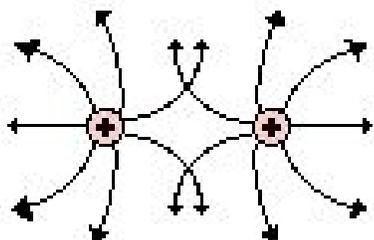
**Diagram D**



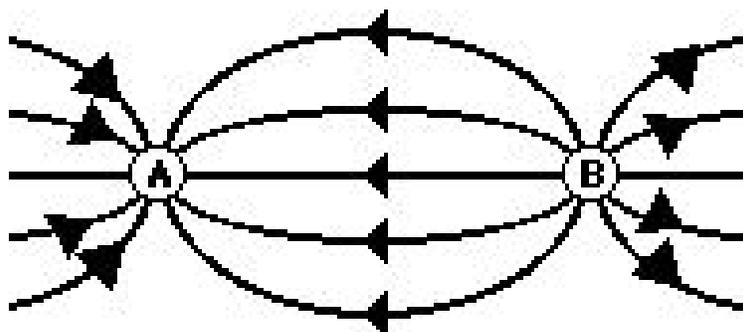
**Diagram E**



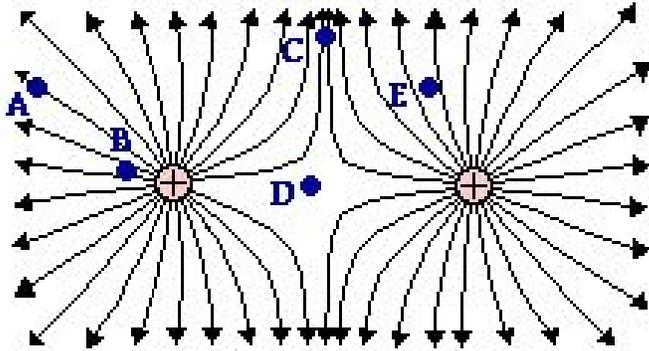
2. Mr. Vo in his haste drew the following electric field lines for a configuration of two charges. What did Mr. Vo do wrong? Explain.



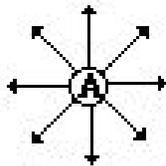
3. Consider the electric field lines shown in the diagram below. From the diagram, it is apparent that object A is \_\_\_\_\_ and object B is \_\_\_\_\_.



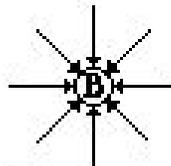
4. Consider the electric field lines drawn at the right for a configuration of two charges. Several locations are labeled on the diagram. Rank these locations in order of the electric field strength - from smallest to largest.



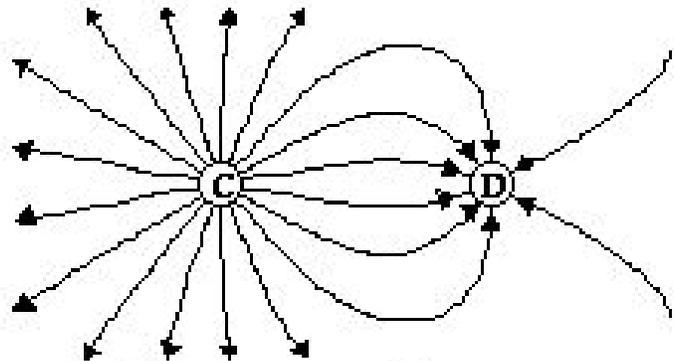
5. Use your understanding of electric field lines to identify the charges on the objects in the following configurations.



A: + or -

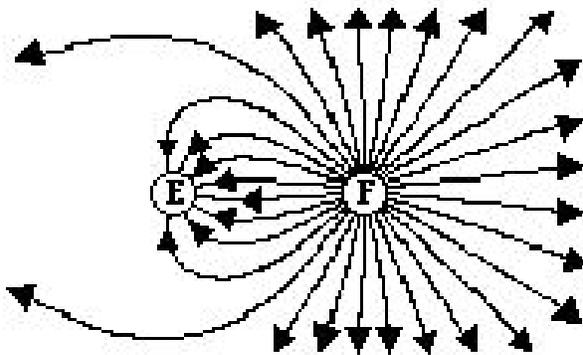


B: + or -



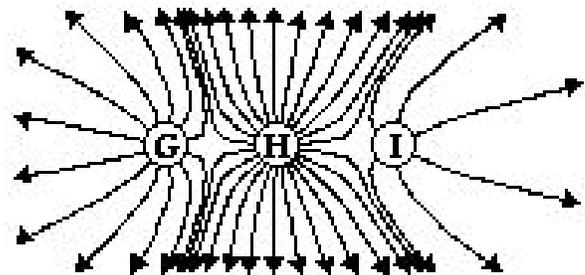
C: + or -

D: + or -



E: + or -

F: + or -

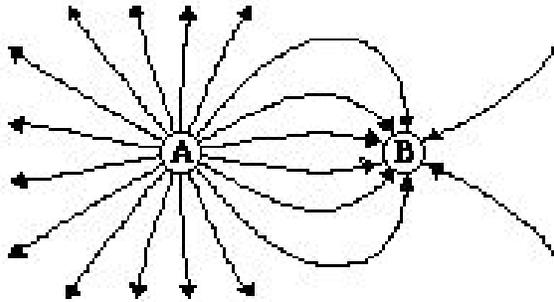


G: + or -

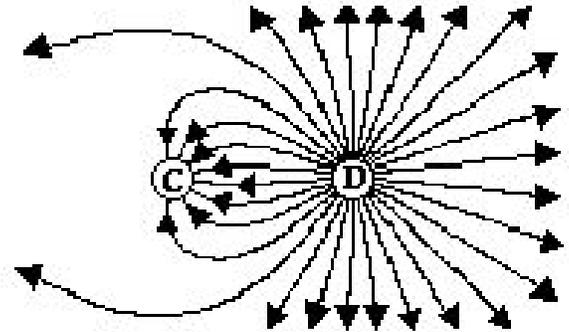
H: + or -

I: + or -

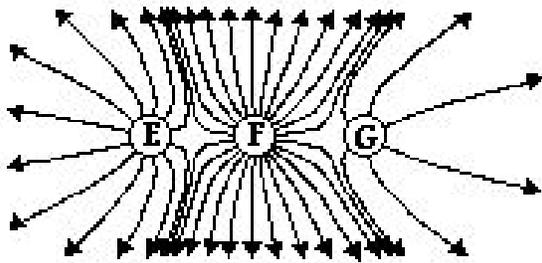
6. Observe the electric field lines below for various configurations. Rank the objects according to which have the greatest magnitude of electric charge, beginning with the smallest charge.



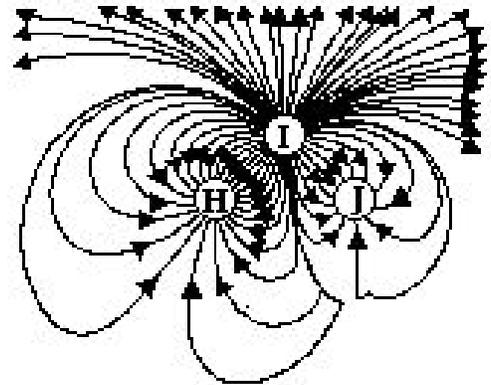
Ranking: \_\_\_\_\_ < \_\_\_\_\_



Ranking: \_\_\_\_\_ < \_\_\_\_\_



Ranking: \_\_\_\_\_ < \_\_\_\_\_ < \_\_\_\_\_



Ranking: \_\_\_\_\_ < \_\_\_\_\_ < \_\_\_\_\_

## Answers

### 1. **C, D and E**

In C, the lines are directed towards a positively charged object.

In D, the lines are not symmetrically positioned despite the fact that the object is a symmetrical sphere.

In E, the lines are directed away from a negative charge.

2. Electric field lines should never intersect each other. Erin crossed his lines.

3. Electric field lines are directed towards object A so object A must be negative. They are directed away from object B so object B must be positive.

4. **DAECB** (the order of C and B are questionable)

Electric field strength is greatest where the lines are closest together and weakest where lines are furthest apart.

5. **Objects A, C, F, G, H and I are positive.**

Objects B, D and E are negatively charged. The principle is: electric field lines always approach negatively charged objects and are directed away from positively charged objects.

6. The rankings are as follows:

$$\mathbf{B < A}$$

$$\mathbf{C < D}$$

$$\mathbf{G < E < F}$$

$$\mathbf{J < H < I}$$

The principle is that objects with the greatest charge will have the greatest number of lines emanating from it or approaching it.