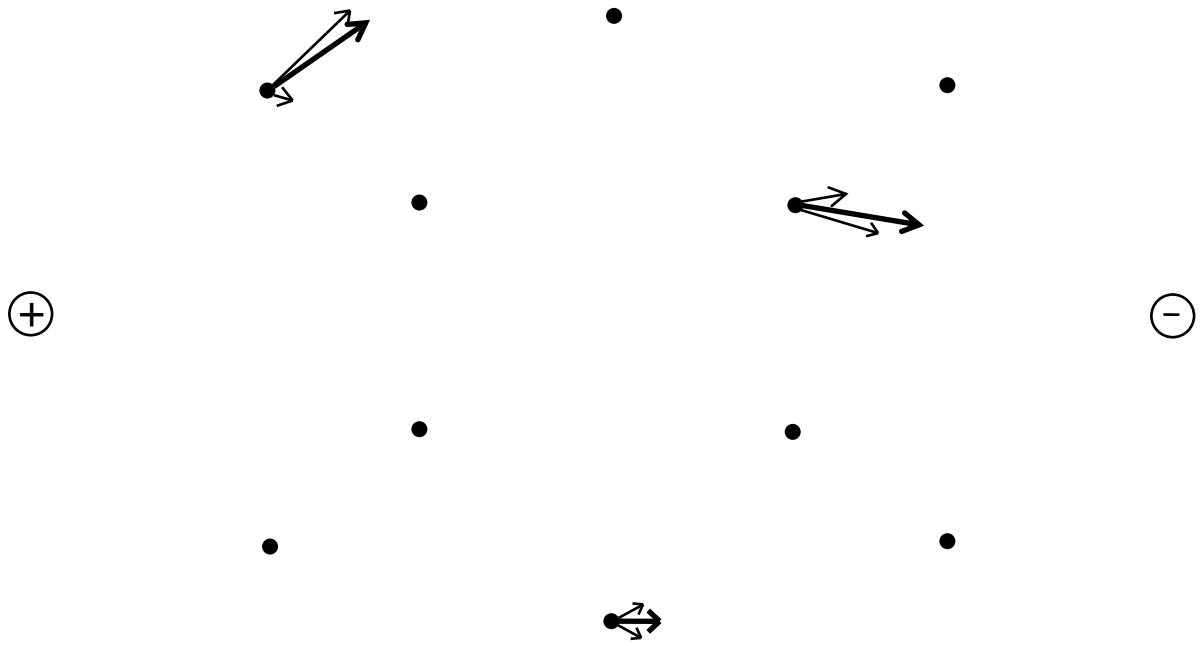
Name_____

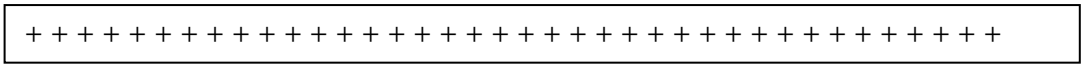
Date_____Pd____

E & M Unit 1 - Worksheet 4

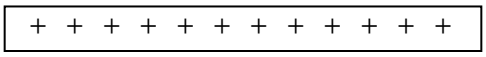
1. In the field mapping exercise you calculated the electric force at various positions from a point charge. In the diagram below, the electric field vector has been determined at three locations. Using symmetry considerations, sketch the net electric field vector at the rest of the locations.



2. Draw the electric field lines around a **positively** charged plate as shown.



3. Two large charged plates are shown below. Imagine that you could place a small positive test charge at various locations on the lower surface of the positively charged plate. If this test charge is released, what will happen to it? Where will it end up?
   Trace the path that you think it will follow from different release locations. Draw at least six such paths.



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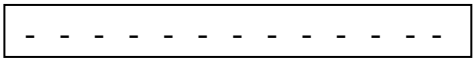

4. Suppose you are given an electric field, but the charges that produce the field are hidden. If a positive test charge brought into the region shows that all the field lines point *into* the hidden region, what can you say about the sign of the charge in that region? How do you know?

5. Suppose you are asked to detect the presence of and measure the strength of an electrical field in space.
   a) What do you need to do to detect the presence of an electric field at a location in space?

   b) What do you need to measure to determine the magnitude (strength) of the field?

   c) How should the size of the test charge compare to the amount of charge that produces the field?