Name: ___Key___

Notes – 18.5 Electric Field Lines: Multiple Charges

1. Drawings using lines to represent electric fields around charged objects are very useful in visualizing field strength and direction. Since the electric field has both __magnitude__ and __direction__, it is a vector. Like all vectors, the electric field can be represented by an arrow that has length proportional to its __magnitude__ and that points in the correct direction.
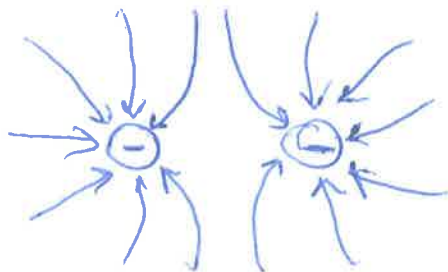
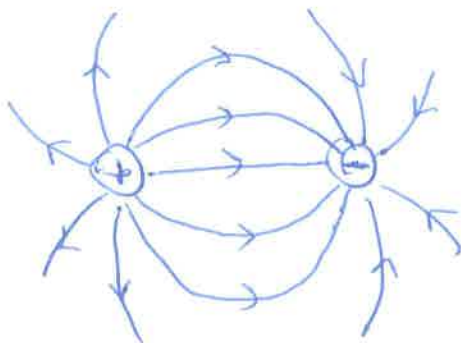2. Draw the electric field lines for a positive point charge.
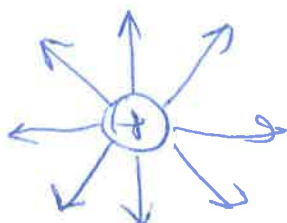
3. Draw the electric field lines for a negative point charge.
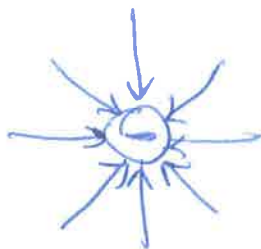
4. Draw the electric field lines for 2 negative point charges in close proximity.

5. Draw the electric field lines for a negative and a positive point charge in close proximity.

6. The properties of electric field lines for any charge distribution can be summarized as follows:
    1. Field lines must begin on __positive__ charges and terminate on __negative__ charges (or at infinity in the hypothetical case of isolated charges).
    2. The number of field lines leaving a positive charge or entering a negative charge is proportional to the __magnitude__ of the charge.
    3. The strength of the field is proportional to the __closeness__ ~~closeness~~ of the field lines.
    4. The direction of the electric field is __tangent__ to the field line at any point in space.
    5. Field lines can never cross. This last property means that the field is __unique__ at any point. The field line represents the direction of the field, so if they crossed, the field would have two directions at that location (an impossibility if the field is unique).