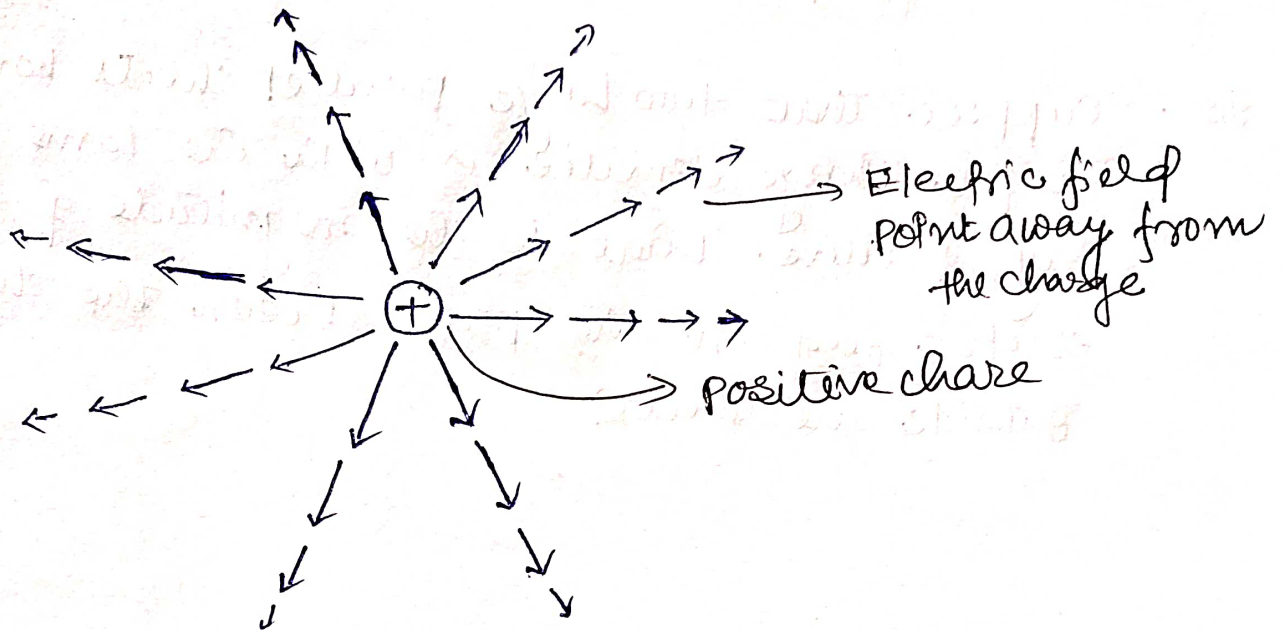


Lines of electric field

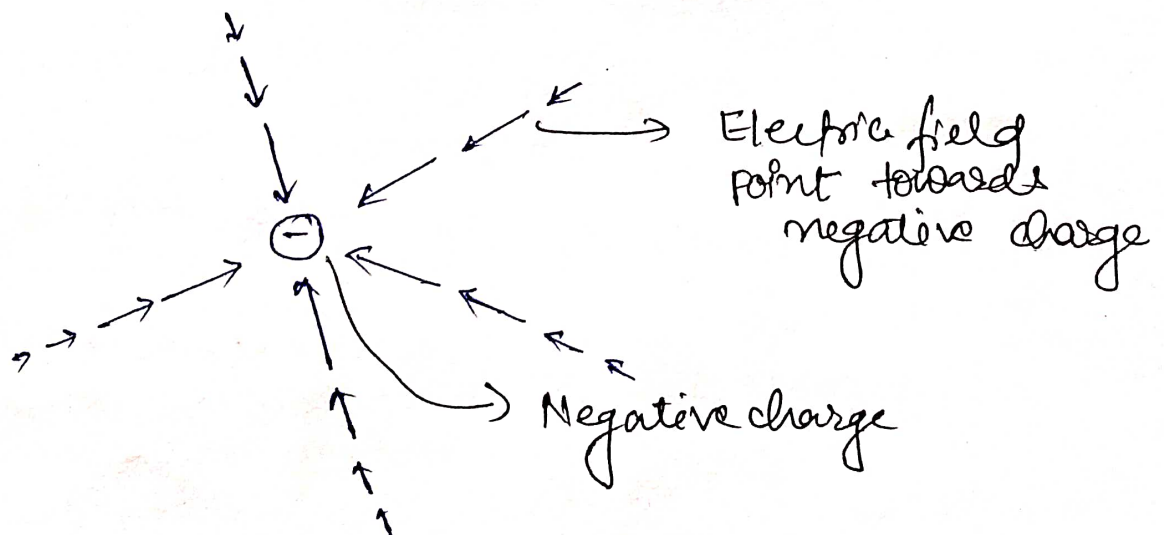
The electric field can be represented graphically by drawing, at any given point of space, a vector whose magnitude and direction are those of the electric field at that point.



The above figure shows the electric field vectors in the space surrounding a positive point charge.

Magnitude of field vector decrease with increase square of distance as shown in above figure length of each arrow is different (showing magnitude).

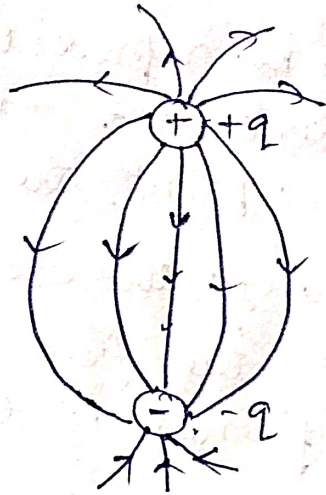
#



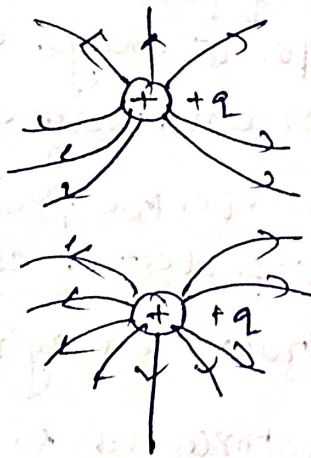
Field Lines

The electric field can also be represented graphically by field lines. These lines are drawn in such a way that, at any given point, the tangent to the line has the direction of the electric field, that is, the direction of the field vector. Furthermore, the density of lines is directly proportional to the magnitude of the electric field; that is, where the lines are closely spaced the electric field is strong, and where the lines are far apart the electric field is weak.

When we draw a pattern of field lines, we must begin each line on a positive point charge and end on a negative point charge (or line may extend to infinity). Since the magnitude of the electric field ~~is~~ is directly proportional to the amount of electric charge, the number of field lines that we draw emerging from a positive point charge must be proportional to the amount of charges.



Field lines generated by positive and negative charge of equal magnitude.



Field lines generated by two positive charges of equal magnitudes.

Note: Field lines start on positive charges and end on negative charges -
 positive charges are source of field lines
 and negative charges are sinks.

- * Field lines never intersect. If the lines ever were to intersect, the electric field would have two directions at the point of intersection. This is impossible.
- * We must refrain from thinking of the field lines as physical object.
- * The electric field is a physical entity, it is a form of matter; but the field lines are merely mathematical crutches to aid our imagination.
- * Electric field is proportional to the density of field lines.
- * Density of line is the number of lines per unit area.