Answer on Question #55047-Physics-Electromagnetism

5- (a) Describe what is meant by an equipotential surface (Be specific please)

(b) Indicate how electric field E geometrically relates to equipotential surfaces. (Be specific please &Make a sketch)

(c) Indicate how the direction of the electric field E (Field lines) relates to equipotential surfaces regarding electric potential (Be specific please and Make a sketch)

Answer

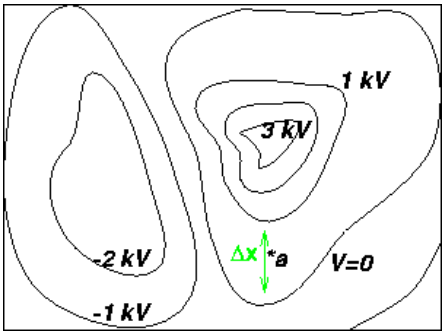
(a) Equipotential surfaces can be shown as lines in two dimensions to provide a quantitative way of viewing electric potential. Every point on a given line is at the same potential.

In 3D equipotential surfaces can be shown as 2D surfaces.

Rules for equipotential lines:

- Electric field lines are perpendicular to the equipotential lines, and point "downhill": from higher potential toward lower.
- A conductor forms an equipotential surface.
- Where equipotential surfaces are close to each other, the electric field is strong.

(b) Where equipotential surfaces are close to each other, the electric field is strong.



The figure shows equipotential lines. The electric field at point a can be found by calculating the slope at a:

$$E = -\frac{\Delta V}{\Delta x}$$

where ΔV is the voltage difference between the two lines near a, and Δx is the distance between the two lines nearest a.

(c) Electric field lines are perpendicular to the equipotential lines, and point "downhill": from higher potential toward lower.