Gauss's Law Chapter 24

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Symmetry

The symmetry of the electric field must match the symmetry of the charge distribution.

Fundamental Symmetries

1. Planar symmetry: The field is perpendicular to the plane.
2. Cylindrical symmetry: The field is radial toward or away from the axis.
3. Spherical symmetry: The field is radial toward or away from the center

Electric Flux

Electric flux, Φ, is the amount of the electric field E that passes through a surface with area A. Electric field only flows in one direction so $E_\perp = E\cos\theta$ is the only part of E that passes through a surface with angle θ between the orientation of that surface and the electric field.

$$\Phi = E_\perp A = EA\cos\theta$$