



Item Navigation

Vector Derivative Identities

Use the Kronecker delta, the Levi-Civita symbol and the Einstein summation convention, and the identities

$$\mathbf{a} \cdot \mathbf{b} = \delta_{ij} a_i b_j, \quad (\mathbf{a} \times \mathbf{b})_i = \epsilon_{ijk} a_j b_k, \quad \epsilon_{ijk} \epsilon_{ilm} = \delta_{jl} \delta_{km} - \delta_{jm} \delta_{kl},$$

to prove the following identities:

(a) $\nabla \cdot (f \mathbf{u}) = \mathbf{u} \cdot \nabla f + f \nabla \cdot \mathbf{u};$

(b) $\nabla \times (\nabla \times \mathbf{u}) = \nabla(\nabla \cdot \mathbf{u}) - \nabla^2 \mathbf{u}.$

✓ Completed

[Go to next item](#)



Like



Dislike



Report an issue

