## **≡** Item Navigation

## **Vector Derivative Identities**

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

$$m{a}\cdotm{b}=\delta_{ij}a_ib_j,\quad (m{a} imesm{b})_i=\epsilon_{ijk}a_jb_k,\quad \epsilon_{ijk}\epsilon_{ilm}=\delta_{jl}\delta_{km}-\delta_{jm}\delta_{kl},$$

to prove the following identities:

(a) 
$$oldsymbol{
abla}\cdot(foldsymbol{u})=oldsymbol{u}\cdotoldsymbol{
abla}f+foldsymbol{
abla}\cdotoldsymbol{u};$$

(b) 
$$oldsymbol{
abla} imes (oldsymbol{
abla} imes oldsymbol{u}) = oldsymbol{
abla}(oldsymbol{
abla}\cdotoldsymbol{u}) - 
abla^2oldsymbol{u}.$$

## ✓ Completed

## Go to next item