Worksheet #18: Green's identities

(1) Construct the product rule for the div operator. In other words, what is $\nabla \cdot \left(u\bar{J}\right)$? [Hint: look for ∇u]

(2) Write out $\nabla \cdot \left(u\bar{J}\right)$ for $\bar{J} = \nabla v$.

(3) Integrate this expression over Ω and use the Divergence theorem. You should get Green's first identity.

(4) From this identity, subtract the same identity with u and v swapped. This leads you to Green's second identity.