

Math 335-002

Homework #9

Due date: March 3, 2008

1. Use suffix notation to show that (you may want to start with the right-hand side of this expression): $\mathbf{u} \cdot \nabla \mathbf{u} = \nabla(|\mathbf{u}|^2/2) - \mathbf{u} \times (\nabla \times \mathbf{u})$
2. Use suffix notation to verify the product rule for $\nabla (\mathbf{u} \cdot \mathbf{v})$ summarized at the top of p. 82, starting with the right-hand side of this product rule expression (basically, you have to reproduce the derivation given in the second half of page 79).
3. Read the solved example problems 2.8 and 2.9 on page 27.
4. Problem 2.1, page 31.