Assignment #6B, Fluid Mechanics 2011

due on Dec. 1st, 2011

1: The amount of vorticity, without regard to direction, is measured by $\omega \cdot \omega$, called the enstrophy, Take $\omega\cdot$(vorticity equation) to find

$$\frac{D(\frac{1}{2}\omega^2)}{Dt} = \omega_i \omega_j S_{ji} + \nu \partial_j \partial_j (\frac{1}{2}\omega^2) - \nu \partial_j \omega_i \partial_j \omega_i.$$

Interpret each term.

2: Explain why does a typhoon in the northern hemisphere always rotate anticlockwise.