

**ATMS442 Homework #6**  
**Due: Wednesday 9 March 2011**

NAME: \_\_\_\_\_

Directions: Answer all questions on separate sheets of paper, and please show all work!

- (1) (a) Briefly describe two physical processes that act to change horizontal temperature gradients. (b) How are the two processes related? (c) Can horizontal temperature gradients be created where none exist initially? Include equations from class in your answer. (4)
- (2) (a) What modes appear on the tropical beta plane, but not in midlatitudes? (b) Give two important ways in which tropical Rossby waves differ from midlatitude Rossby waves. (c) What organized systems are found in tropical observations, but not in the beta-plane theory? (4)
- (3) In El Nino, tropical easterly winds weaken, allowing warm water to move eastward along the equator. In terms of tropical  $\beta$ -plane theory, which waves are most important for El Nino? (2)