San Francisco State University   Name _____
Department of Earth & Climate Sciences   Spring 2018

ERTH 260: Homework #9
Algebraic Representations and Physical Interpretations
of Change in Time and Space

Answer on separate sheet.   Do not jam answer on this sheet.

(Due Wednesday 25 April 2018; 100 points)

1. Vertical wind shear is the variation of the horizontal wind with height (z axis). Horizontal wind shear is the variation of the vertical wind in the horizontal (x or y axis, or s and n axis).

    Express the following algebraically (with symbols) (12 pts each):
    a. the vertical wind shear of the west wind in rectangular coordinates
    b. the vertical wind shear in natural coordinates
    c. the horizontal shear of the vertical wind on the west-east axis

2. Give a physical interpretation of the following? (Example: $\Delta u/\Delta x$ is the change or variation of the west wind along the west/east axis) (12 pts each):

    a. $(\Delta p/\Delta t)_{\text{air parcel}}$
    b. $(\Delta T/\Delta z)_{\text{air parcel}}$
    c. $(\Delta T/\Delta t)_{\text{Local}}$
    d. $\Delta V/\Delta z$

3. Provide a sketch to illustrate 2(d). (14 pts)