MET 4532 Homework #3 _____
name

1. Hurricane Zoë is in an easterly (i.e., blowing straight from the east--- toward the west , 270° on a compass) steering flow at 5 m s^{-1}. For a cyclone with Zoë's size and latitude, the β drift is toward the NW (315°) at 2.0 m s^{-1}. Hint, cos 45° = sin 45° = 0.7071.

    a. What are the westward (*X*) and northward (*Y*) components of Zoë's total motion due to steering and β?

    b. What is Zoë's speed of motion due to the combined effects of steering and β?

    c. What is Zoë's approximate direction of motion (W, WNW, NW, NNW, N, …, or compass heading) due to the combined effects of steering and β?

    Hint: Solution of this problem requires use of vectors. In vector addition the velocities in the E-W and N-S directions are added separately. For example, $C_{XTOT} = C_{XSTEER} + C_{XBETA}$, and $C_{YTOT} = C_{YSTEER} + C_{YBETA}$. The magnitude of the resulting total motion (the speed) is computed using Pythagoras' Theorem, $C_{TOT} = \sqrt{C_{XTOT}^2 + C_{YTOT}^2}$. You should be able to get the approximate direction by drawing a to-scale sketch, or you could calculate it using, Direction = $360^o - \tan^{-1}(C_{XTOT} / C_{YTOT})$

2. Zoë made landfall at 00h UTC (midnight) on the 19th with 56 m s^{-1} maximum winds. Using Kaplan and DeMaria's rule for inland decay (and neglecting immediate frictional effects on the surface winds), what would Zoë's winds in m s^{-1} be:

    a. After 7h?

    b. After 14h?

    c. After 21h?

Due Friday 13OCT17.