

### Slightly More Challenging Vector Problems

- 1) Ashley walks 300 meters due West, then 400 meters due northwest, then 500 meters at  $36.87^\circ$  West of South, then 200 meters due South. How far is she and in what direction from her starting point?
- 2) Chris wants to go to Dan's house, and he knows it is 30 miles away at an angle of  $30^\circ$  East of North. Because of the orientation of the available roads, Chris initially bicycles 20 miles at  $10^\circ$  South of East. How far away and in what direction would he have to ride (assuming there's an appropriate path in that direction) to get to Dan's house?
- 3) Two forces act on an object...one force, A, of 50 Newtons at  $20^\circ$  South of West, and another force, B, of 80 Newtons at  $10^\circ$  West of South.
  - a) Draw a diagram of the forces
  - b) Use a graphical method to add the forces and estimate the magnitude and direction of the resultant
  - c) Use trigonometry to resolve the forces into components (SOHCAHTOA!)
  - d) Add the forces using the components, computing accurate values for both the magnitude and direction of the resultant (be careful with signs)
  - e) What third force would balance the first two forces?
- 4) Mr. Coe hits a 240 yd drive due North on Hole #13 at the Green Pond Country Club. He knows that the green (his anticipated target) is 385 yds from the tee (his starting point) at an angle of  $20^\circ$  W of N. How far and in what direction should he hit his next shot? (And can you tell me what club he should use???)