AE 457/641 – Navigation and Guidance
Tutorial 2, August 16, 2007

1. A vessel moving in drifting waters with a speed of 5 knots (relative to the water) has a true heading of 30° and measures range rates of 3.3 knots and -2.5 knots to two landmarks on the shore visible at relative bearings 35° and 135°, respectively. Find the direction and magnitude in knots of the tidal drift. (**Saurabh Goel** (04D01004) + partner)

2. A vessel moving in drifting waters with a speed of 1.4 knots (relative to the water) has a true heading of 320°. At a certain instant, the vessel observes two landmarks on the shore at relative bearings 23.5° and 96.2°. Five minutes later, the same landmarks are found to have relative bearings 35° and 107.5°, respectively. If the second landmark is 0.8 nautical miles due west, and 0.35 nautical miles due south of the first, find the direction and magnitude in knots of the tidal drift. (**Parikshit** (04D01016) + partner)

3. The star Vega in the constellation of Lyra (or the Harp), and the star Deneb from the constellation of Cygnus (the Swan) are observed to have elevation angles of 47.65° and 61.43°, respectively, when observed from Mumbai at 1900 GMT on August 16, 2007. Use these observations to find the latitude and longitude of Mumbai. (Hint: Use an online nautical almanac to find the necessary data.) (**Sumeet** (04001005) + partner)