Chapter 2 Written Homework Problems
DUE: January 27 at the beginning of class
SHOW ALL WORK FOR FULL CREDIT
EXPRESS ALL ANSWERS IN _SI_ UNITS

1. You leave Washington, DC at 8 AM Eastern Time on a flight to Los Angeles. At the same time your friend leaves Los Angeles on a flight to Washington, DC. The travel distance in both cases is 3700 km. You have a strong head wind and fly at 460 mph (ground speed). Your friend has a strong tail wing and flies at 680 mph (Ground speed). At what time and where does your plane pass your friend's plane?

2. A foul ball travels straight up and is in the air for 5.0 s before striking the ground *(a)* What was the velocity of the ball when it left the bat? *(b)* To what height did the ball rise? You may ignore air resistance and the relatively small height from which the ball leaves the bat.

3. Driving west on Lead Ave. you realize you are speeding and slow, with constant acceleration (or deceleration in this case if you prefer), from 40 mph to 30 mph. If it takes you 75 m to slow to 30 mph, *(a)* What is the magnitude and direction of your acceleration? *(b)* How long does it take you to slow to 30 mph?*(c)* What is you average velocity over that time interval? Assuming you were to continue your constant deceleration from 40 mph to a stop, *(d)* How much time would elapse and *(e)* How far would you travel before you came to rest?

4. At the Albuquerque Balloon Fiesta you watch a parachutist step out of a stationary hot air balloon. The parachutist falls 50 m without friction before the parachute suddenly opens. You measure that is takes the parachutist a total of 18 s to reach the ground once he steps from the balloon and you estimate his velocity to be 2.0 m/s when he reaches the ground. His acceleration can be assumed to be constant after the parachute opens. What was the altitude of the balloon when he stepped out?

5. During vertical jumps basketball players often appear to hang nearly motionless in the air at the top of their jump. To help explain this, consider a leap of height *h*. What fraction of the player's time in the air is spent at a height greater than ½ *h*?