PHY151 Practical Questions for Sept 26 to 30

1. The wheels on a car go from 2.0 rotations per second to 4.0 rotations per second during a 5.0 second interval. How many rotations did the tires complete during this time interval, assuming constant acceleration? If the tires have a diameter of 82 cm, how far does the car travel during this time interval?

2. A 25 kg sled is pulled along grass (kinetic coeffecient of friction is 0.65) at constant speed by a rope which makes an angles of 35 degree from the horizontal. What is the magnitude of the tension in the rope?

3. What is the best angle (to get the farthest distance) to throw a rock if you are at the bottom of a hill of constant slope? Note: find an equation involving just the two angles (initial velocity angle and angle of the hill), not a numerical answer. Check that when the hill angle is zero, your answer should be 45 degrees.

4. Modelling question: In baseball, many pitchers can throw curve balls. The ball is thrown a distance of about 17 m, and it curves by a small but noticeable amount (enough to cause the batter to miss the ball). Estimate the force of the air on the ball during such a throw as a ratio of the force of gravity on the ball. Comment on whether air is negligible for baseballs.