PHY 166, Fall 2021, Final Exam   Practice
(5 points maximum for each problem, 25 points maximum for the whole)

1. A car is traveling with a constant speed 80 miles per hour a road that makes half a circle. What is the average velocity of the car?

2. A ball rolls off a shelf with a horizontal velocity of v. At what horizontal distance from the shelf does the ball land if the height of the shelf is h above the floor?

3. A car travels around a circle with a diameter of 500 m at a constant speed of 25 m/s. The static friction coefficient is 0.3 and the kinetic friction coefficient is 0.2. Will the car skid?

4. Two masses of 3 kg and 5 kg collide head-on, the former moving to the right with the speed 5 m/s and the latter moving to the left with the speed 3 m/s. After collision they stick together. What amount of mechanical energy is lost?

5. A cylinder with a uniform density is rolling over a plane. What fraction of its kinetic energy is rotational kinetic energy?