1. The 10kg crate is being pulled 5m along a floor by an 80N force 30\textdegree above the horizontal. The \( \mu_k \) between the floor and the crate is 0.1. Determine the work done on the crate by each of the following forces: a) the 80N force, b) the gravity, c) the normal force, d) the friction, e) the net force. f) Find the change in the kinetic energy of the crate.

2. A car weighing 1000kg accelerates from 20m/s to 30m/s over a distance 500m. Find the average force on the truck.

3. You are designing a roller coaster with a loop that comes after a large drop. If the peak of the drop has a height of 120m what is the maximum radius the loop can have if the carts are to maintain a velocity of 15m/s?

4. A football traveling at 25.5m/s moves a receiver’s hands backward 0.2m when the ball is caught. What was the average amount of force exerted by the ball on the receiver’s hands? (m=0.4kg)

5. A ball starting at rest is kicked along a frictionless surface at a constant velocity of 5m/s. After traveling 12m on the surface the ball drops from a height of ‘\( h \)’ and impacts the ground at a speed of 9m/s. Find \( h \).