One Dimensional Kinematics Set 1

1. A plane starting from rest at one end of a runway undergoes a constant acceleration of 1.60 m/s2 for a distance of 1600. m before takeoff. (a) What is its velocity upon takeoff? (b) What is the time required for takeoff?
2. A ball initially at rest rolls down a hill with an acceleration of 3.3 m/s2. (a) If it accelerates for 7.5 s, how far will it move? (b) How fast will it be moving after 7.5 s? c) How far would it have moved if it started with an initial velocity of 5.0 m/s rather than at rest?
3. A car traveling at 24.4 m/s begins slowing down with an acceleration of – 8.00 m/s2. (b) How fast is the car going after 2.50 seconds? (a) How long does it take the car to come to a stop? (b) How far does the car travel before it stops?
4. A car moving along a level road increases its velocity uniformly from 16.0 m/s to 32 m/s in 10.0 s. (a) What is the cars acceleration? (b) What is its average velocity? (c) How far did it move while accelerating?
5. Skid marks at the scene of an accident show that the car continued to move 75.0 m after the brakes were applied before coming to a complete stop. If the brakes decelerate the car at

– 8.4 m/s2, what was the car’s velocity when the brakes were applied?