

Motion Equations-1

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1. A body starts from rest with a uniform acceleration 2 ms^{-2} . Find the distance covered by the body in 2 s.
2. A body starts with an initial velocity of 10 m/s and acceleration 5 ms^{-2} . Find the distance covered by it in 5 s.
3. A vehicle is accelerating on a straight road. Its velocity at any instant is 30 kmph, after 2 s, it is 33.6 kmph. Find the acceleration of vehicle in ms^{-2} . Is the acceleration uniform?
4. A body, initially at rest, starts moving with a constant acceleration 2 ms^{-2} . Calculate:
 - a. The velocity acquired and
 - b. The distance travelled in 5 seconds
5. A bullet initially moving with a velocity 20 m/s strikes a target and comes to rest after penetrating a distance 10 cm in target. Calculate the retardation caused by the target.
6. When brakes are applied to a bus, the retardation produced is 25 cm s^{-2} and the bus takes 20 s to stop. Calculate :
 - a. The initial velocity of bus
 - b. The distance travelled by bus during the time.
7. A body moves from rest with a uniform acceleration and travels 270 m in 3 s. Find the velocity of the body at 10 s after start.
8. A body moving with a constant acceleration travels the distances 3m and 8 m respectively in 1 s and 2 s. Calculate
 - a. Initial velocity
 - b. Acceleration of the body
9. A car travels with a uniform velocity of 25 m/s for 5 s. The brakes are then applied and the car is uniformly retarded and comes to rest in further 10 s. Find :
 - a. The distance which the car travels before the brakes are applied,
 - b. The retardation, and
 - c. The distance travelled by the car after applying the brakes.
10. A space craft flying in a straight course with a velocity of 75 km s^{-1} fires its rocket motors for 6.0 s. At the end of this time, its speed is 120 km s^{-1} in the same direction. Find:
 - a. The space craft's average acceleration while the motors were firing.
 - b. The distance travelled by the space craft in the first 10 s after the rocket motors were started, the motors having been in action for only 6.0 s.