

Worksheet 2.6 - Kinematic Equations

1. A ball rolling down a hill was displaced 19.6 m while uniformly accelerating from rest. If the final velocity was 5.00 m/s. what was the rate of acceleration?

2. A car starts from rest and accelerates uniformly to reach a speed of 21 m/s in 7.0 s. What was the speed of the object after 2.0 seconds?

3. A bike rider accelerates uniformly at 2.0 m/s^2 for 10.0 s. If the rider starts from rest, calculate the distance traveled in the **fourth** second.
(i.e. between $t = 3 \text{ s}$ and $t = 4 \text{ s}$).

4. If a bullet leaves the muzzle of a rifle at 600.0 m/s, and the barrel is 0.90 m long, what was the acceleration of the bullet while in the barrel?

5. The Jamaican bobsled team hit the brakes on their sled so that it decelerates at a uniform rate of 0.43 m/s^2 . How long does it take to stop if it travels 85 m before coming to rest?

Bonus: A driver of a car going 90 km/h suddenly sees the lights of a barrier 40.0 m ahead. It takes the driver 0.75 s before he applies the brakes (this is known as reaction time). Once he does begin to brake, he decelerates at a rate of 10.0 m/s^2 .

a) Does he hit the barrier?

b) SUPER-BONUS: What would be the maximum speed at which the car could travel and NOT hit the barrier 40.0 m ahead?