**KINEMATICS WORKSHEET 3**

**Equations of Uniformly Accelerated Motion**

1. A toy car accelerates uniformly from rest to a speed of 5 ms-1 in a time of 2 seconds. What is the acceleration of this car?
2. A bullet fired from a pistol leaves the barrel with an initial velocity of 250 ms-1 vertically upwards. Assuming the bullet decelerates due to gravity only, at the rate of 9.8 ms-2, calculate the height above the end of the barrel reached by the bullet before coming to rest.
3. A truck with an initial speed of 27 ms-1 applies its brakes and slows down for a time of 5 seconds. If the brakes produce an acceleration of – 4 ms-2, find the distance travelled by the truck during its deceleration. Also, determine the final velocity of the truck.
4. A stone dropped from the top of a building takes 2.50 s to reach the ground. How high is the building? How long would a stone with twice the mass take to fall?
5. A Go-Kart accelerates uniformly from 20 ms-1 to 40 ms-1 in a time of 5 s.
   1. Find the magnitude of the average velocity of the go-kart.
   2. Calculate the magnitude of the acceleration of the go-kart.
   3. Determine the magnitude of the change in displacement of the go-cart during this time period.

**Extension Questions**

1. A drone with an initial speed of 2 ms-1 accelerates at 4 ms-2 over a distance of 12 m. It then ceases to accelerate. How long did the acceleration period last?
2. A particle travels with uniform acceleration in one direction. If its initial speed is 21 cm/s and it travels 54 cm in the sixth second, find its acceleration.

**ANSWERS:**

See the supplied pdf of the solutions on the Kinematics Module web page.