A Level Maths

Topic: Constant Acceleration Equations (SUVAT)

Instructions

Answer all questions. Show complete working. Use the SUVAT equations where applicable.

Practice Questions

1. A car accelerates from rest at a constant acceleration of $2\,\text{m/s}^2$. Find the velocity after 5 seconds.

2. A stone is thrown vertically upwards with an initial velocity of $15\,\text{m/s}$. Find the time taken for the stone to reach its maximum height.

3. A car travels with an initial velocity of $20\,\text{m/s}$ and accelerates at $2\,\text{m/s}^2$ for 10 seconds. Find the distance traveled by the car.

4. A body is moving with an initial velocity of $10\,\text{m/s}$ and decelerates at $3\,\text{m/s}^2$. Find the time it takes for the body to come to rest.

5. A car starts from rest and accelerates at $3\,\text{m/s}^2$ for 8 seconds. Find the distance it travels during this time.

6. A particle is moving with an initial velocity of $5\,\text{m/s}$ and accelerates at $4\,\text{m/s}^2$. Find the velocity after 3 seconds and the distance traveled during this time.

7. A ball is dropped from a height. Find the time taken for the ball to reach the ground, assuming the acceleration due to gravity is $9.8\,\text{m/s}^2$ and the initial velocity is 0.

8. A rocket is launched vertically with an initial velocity of $50\,\text{m/s}$ and accelerates at $10\,\text{m/s}^2$. Find the time taken for the rocket to reach a height of $1000\,\text{m}$.

9. A train moves with an initial velocity of $10\,\text{m/s}$ and decelerates at $0.5\,\text{m/s}^2$ until it comes to a stop. Calculate the total distance covered during the deceleration.

10. A car accelerates uniformly from $0\,\text{m/s}$ to $30\,\text{m/s}$ in 10 seconds. Find the acceleration and the distance covered during this time.

Multiple-Choice Questions

1. A car accelerates from rest at $4\,\text{m/s}^2$. What is its velocity after 8 seconds?

   A. $24\,\text{m/s}$
   B. $32\,\text{m/s}$
   C. $36\,\text{m/s}$
   D. $40\,\text{m/s}$

2. A stone is dropped from a height and falls under gravity. How long will it take to fall 20 meters? (Assume $g = 10\,\text{m/s}^2$)

   A. 2 seconds
   B. 4 seconds
   C. 3 seconds
   D. 5 seconds

3. A ball is thrown vertically upwards with an initial velocity of $12\,\text{m/s}$. What is the time taken for the ball to reach the maximum height? (Assume $g = 9.8\,\text{m/s}^2$)

   A. 1.2 seconds
   B. 1.5 seconds
   C. 1.8 seconds
   D. 2.0 seconds

4. A car starts from rest and accelerates uniformly at $2\,\text{m/s}^2$. How far will the car travel in 10 seconds?

   A. 50 meters
   B. 100 meters
   C. 150 meters
   D. 200 meters

5. A body is moving with an initial velocity of $20\,\text{m/s}$ and accelerates at $5\,\text{m/s}^2$ for 4 seconds. What will be its final velocity?

   A. $40\,\text{m/s}$
   B. $50\,\text{m/s}$
   C. $60\,\text{m/s}$
   D. $70\,\text{m/s}$