

PROBLEMS

1. A particle of mass m moves in a straight line with constant acceleration a . It starts from rest at the origin. Find its velocity and displacement after time t .

2. A particle is projected vertically upwards with an initial velocity u . Find the time it takes to reach a height h and the time it takes to return to the ground.

3. A particle is projected from the top of a cliff of height H above the ground with an initial velocity u . Find the time it takes to reach the ground and the velocity with which it strikes the ground.

4. A particle is projected from the ground with an initial velocity u at an angle θ to the horizontal. Find the time it takes to reach a height h and the horizontal distance it travels.

5. A particle is projected from the ground with an initial velocity u at an angle θ to the horizontal. Find the time it takes to reach its maximum height and the maximum height it reaches.

SOLUTIONS

1. $v = at$
 $s = \frac{1}{2}at^2$

2. $h = ut - \frac{1}{2}gt^2$
 $t = \frac{u \pm \sqrt{u^2 - 2gh}}{g}$

3. $H + ut - \frac{1}{2}gt^2 = 0$
 $t = \frac{u \pm \sqrt{u^2 + 2gH}}{g}$

4. $h = ut - \frac{1}{2}gt^2$
 $t = \frac{u \pm \sqrt{u^2 - 2gh}}{g}$

5. $u \sin \theta = gt$
 $H = \frac{u^2 \sin^2 \theta}{2g}$

KINGSTON



Kingston is a city in Jamaica, known for its rich history and culture. It is the capital of the country and is home to many important institutions, including the University of the West Indies and the National Parliament. The city is also a major center for commerce and industry in the Caribbean region.