

Projectile on an inclined plane

Questions

1. Is x -component of velocity constant during the motion?
2. Is y -component of velocity constant during the motion?
3. Is the component of velocity parallel to the inclined plane constant during the motion?
4. Is the component of velocity perpendicular to the inclined plane constant during the motion?
5. At the highest point on its trajectory (w.r.t. The ground) is v_{parallel} or $v_{\text{perpendicular}}$ equal to zero?
6. For a fixed angle of inclination and initial speed, what should be the angle of projection so that the perpendicular distance from the inclined plane is the maximum?
7. For a fixed angle of inclination and initial speed, what should be the angle of projection so that the range on the inclined plane is the maximum?
8. For a fixed angle of inclination and initial speed, what should be the angle of projection so that the projectile hits the inclined plane normally?
9. For a fixed angle of inclination and initial speed, what should be the angle of projection so that the projectile hits the inclined plane parallel to the ground?
10. For an angle of projection of 45 degrees w.r.t. the plane is the range maximum along the plane?

Note :

While simulations help to provide valuable insights and visualizations, a rigorous mathematical solution should always be considered as a benchmark, demonstrating not just familiarity with the concept, but a deep understanding of the underlying principles.

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