Worksheet: Motion in a Plane

Uttar Pradesh State Board · Class 11 · Physics · 10 questions · 33 marks

Name: _____ Date: _____ Score: _____ / 33

Q1. A vector has components Ax = 3 and Ay = 4. Find its magnitude and direction. *[2 marks]*

Q2. Evaluate i.j and i x j for the unit vectors along the x and y axes. *[2 marks]*

Q3. A stone is thrown horizontally from a cliff. What is its vertical velocity the instant it leaves the hand, and how does that affect the time it takes to land? *[2 marks]*

Q4. Two forces of 6 N and 8 N act at a point with 60 degrees between them. Find the magnitude of the resultant. *[3 marks]*

Q5. A projectile is fired at 50 m/s at 30 degrees to the horizontal. Find the time of flight, maximum height and range (g = 10 m/s^2). *[5 marks]*

Q6. A stone is thrown horizontally at 20 m/s from a height of 80 m. Find its horizontal range (g = 10 m/s^2). *[3 marks]*

Q7. A particle moves in a circle of radius 20 cm at 5 revolutions per second. Find its linear speed and centripetal acceleration. *[3 marks]*

Q8. For A = 3i + 4j and B = 4i - 3j, find A.B and comment on the angle between them. *[3 marks]*

Q9. A ball is thrown at 20 m/s at 60 degrees to the horizontal. Find its speed and the direction of its velocity 1.0 s after launch (g = 10 m/s^2). *[5 marks]*

Q10. Show that for a given launch speed, the ranges at 25 degrees and at 65 degrees are equal, and state which of the two reaches the greater height. *[5 marks]*