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Projectile Motion Quiz Answer Key PDF

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Explain why the horizontal component of a projectile's velocity remains constant if air resistance is ignored.

The horizontal component of a projectile's velocity remains constant because, in the absence of air resistance, there are no external forces acting in the horizontal direction to change that velocity.

What is the significance of the maximum height in projectile motion, and how is it calculated?

The maximum height is significant as it affects the time of flight and range; it is calculated using $h = (v^2 * \sin^2(\theta)) / (2 * g)$.

Discuss the role of gravity in determining the path of a projectile.

Gravity plays a crucial role in determining the path of a projectile by exertively pulling it downward, which causes the projectile to follow a curved trajectory rather than a straight line.

How does the initial velocity of a projectile influence its trajectory?

The initial velocity of a projectile significantly influences its trajectory by affecting both the maximum height and horizontal distance it can achieve.

Describe how the launch angle affects the range of a projectile.

The range of a projectile is maximized at a launch angle of 45 degrees; angles below or above this lead to decreased range due to the distribution of vertical and horizontal velocity components.

Why is it important to separate the horizontal and vertical components when analyzing projectile motion?

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It is important to separate the horizontal and vertical components when analyzing projectile motion because the horizontal motion is uniform (constant velocity) while the vertical motion is influenced by gravity (accelerated motion).

At what point in its trajectory does a projectile have zero vertical velocity?

A. At launch

B. At the peak ✓

C. Just before landing

D. Throughout the flight

Which angle of launch will give a projectile the maximum range?

A. 30 degrees

B. 45 degrees ✓

C. 60 degrees

D. 90 degrees

What happens to the horizontal component of velocity as a projectile moves?

A. It increases

B. It decreases

C. It remains constant ✓

D. It becomes zero

Which of the following are components of projectile motion? (Select all that apply)

A. Horizontal motion ✓

B. Vertical motion ✓

C. Circular motion

D. Linear motion

Which factor is typically ignored in basic projectile motion calculations?

A. Gravity

B. Air resistance ✓

C. Initial velocity

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D. Launch angle

Which component of projectile motion remains constant if air resistance is ignored?

A. Vertical velocity

B. Horizontal velocity ✓

C. Vertical acceleration

D. Horizontal acceleration

In the absence of air resistance, which of the following statements are true about projectile motion? (Select all that apply)

A. The horizontal velocity remains constant. ✓

B. The vertical velocity remains constant.

C. The path is a parabola. ✓

D. The acceleration is zero.

What shape does the trajectory of a projectile typically follow?

A. Circular

B. Linear

C. Parabolic ✓

D. Elliptical

What is the approximate value of acceleration due to gravity on Earth?

A. 8.91 m/s²

B. 9.81 m/s² ✓

C. 10.81 m/s²

D. 11.81 m/s²

What is the primary force acting on a projectile in motion?

A. Friction

B. Gravity ✓

C. Air resistance

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D. Tension

Which factors affect the range of a projectile? (Select all that apply)

A. **Initial velocity** ✓

B. **Launch angle** ✓

C. Mass of the projectile

D. **Acceleration due to gravity** ✓

What are the characteristics of vertical motion in projectile motion? (Select all that apply)

A. Constant velocity

B. **Constant acceleration** ✓

C. **Affected by gravity** ✓

D. Independent of horizontal motion

Which factors are considered when calculating the time of flight for a projectile? (Select all that apply)

A. **Initial vertical velocity** ✓

B. Horizontal velocity

C. **Gravity** ✓

D. **Launch angle** ✓

Which of the following equations are used to calculate vertical displacement in projectile motion? (Select all that apply)

A. $y = v_{y0} \cdot t + \frac{1}{2}gt^2$ ✓

B. $x = v_{x} \cdot t$

C. $v_{y} = v_{y0} + gt$ ✓

D. $R = \frac{v_0^2 \sin(2\theta)}{g}$

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