Circular Motion Quiz Answer Key PDF

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What is the term for motion along the circumference of a circle at a constant speed?

A. Non-Uniform Circular Motion
B. Uniform Circular Motion ✓
C. Linear Motion
D. Rotational Motion

Which force is responsible for keeping an object moving in a circular path?

A. Gravitational Force
B. Centripetal Force ✓
C. Frictional Force
D. Centrifugal Force

What is the unit of angular velocity?

A. Meters per second
B. Radians per second ✓
C. Degrees
D. Newtons

Which of the following are examples of circular motion? (Select all that apply)

A. A car turning around a bend ✓
B. A pendulum swinging
C. A satellite orbitin Earth ✓
D. A spinning top ✓

How does the moment of inertia affect the angular acceleration of an object in circular motion?

The moment of inertia affects angular acceleration inversely; a larger moment of inertia leads to a smaller angular acceleration for the same applied torque.

Explain the difference between centripetal and centrifugal forces.

Centripetal force acts towards the center of the circular path, keeping the object in motion, whereas centrifugal force is a perceived force that seems to push the object away from the center when viewed from a rotating reference frame.

Discuss the role of friction in enabling a car to navigate a circular track.

Friction between the car's tires and the track allows the car to navigate a circular path by providing the centripetal force required to keep it in motion along the curve.

What factors affect the magnitude of centripetal acceleration? (Select all that apply)

A. Mass of the object
B. Speed of the object ✓
C. Radius of the circle ✓
D. Angular displacement

In non-uniform circular motion, which of the following can change? (Select all that apply)

A. Angular Velocity ✓
B. Radius of the path
C. Speed of the object ✓
D. Direction of motion ✓

Which statements are true about angular displacement? (Select all that apply)

A. It is a vector quantity.
B. It is measured in radians. ✓
C. It represents the angle through which an object has rotated. ✓
D. It is always positive.

What are the implications of Newton's second law in analyzing circular motion?

In circular motion, Newton's second law indicates that the net force acting on an object is the centripetal force, which is necessary to keep the object moving along a curved path.

Which of the following are true about centripetal force? (Select all that apply)

A. It acts outward from the center.
B. It is necessary for circular motion. ✓
C. It can be provided by gravitational force. ✓
D. It is a fictitious force.

Provide a real-world example of non-uniform circular motion and explain the forces involved.

A car navigating a curved road while accelerating or decelerating.

In circular motion, which forces can act as centripetal force? (Select all that apply)

A. Tension in a string ✓
B. Friction between tires and road ✓
C. Normal force ✓
D. Air resistance

What is the effect of increasing the radius on the centripetal force required for a given mass and speed?

A. Increases
B. Decreases ✓
C. Remains the same
D. Beecomes zero

Which of the following quantities is conserved in uniform circular motion?

A. Linear Velocity
B. Angular Velocity ✓
C. Centripetal Force
D. Angular Displacement

In circular motion, what is the direction of centripetal acceleration?

A. Tangential to the circle
B. Outward from the center
C. Towards the center ✓
D. Along the path of motion

Describe how the concept of angular velocity is applied in the functioning of a Ferris wheel.

In a Ferris wheel, angular velocity is applied as the wheel rotates around its central axis, allowing passengers to move in a circular path at a constant speed, which is measured in radians per second.

Which of the following is a scalar quantity in circular motion?

A. Angular Velocity
B. Angular Displacement ✓
C. Centripetal Force
D. Centripetal Acceleration

What is the relationship between linear velocity v and angular velocity ω?

A. $v = \omega \cdot r$ ✓
B. $v = \omega / r$
C. $v = \omega^2 \cdot r$
D. $v = r / \omega$