


Mastering Physics Answer Key Chapter 2

HW 10
Exercise 10.29 - Enhanced - with Solution

A thin light string is wrapped around the outer rim of a uniform hollow cylinder of mass 4.35 kg having inner and outer radii as shown in the figure (Figure 1). The cylinder is then released from rest.

For related problem-solving tips and strategies, you may want to view a Video Tutor Solution of Acceleration of a primitive yo-yo.

Figure 1 of 1



Part A

How far must the cylinder fall before it reaches a speed of 2.00 m/s?

Express your answer in meters.

$d =$

Part B

If you just dropped this cylinder without the string, how long would it take to reach the same speed?

Express your answer in meters per second.

$t =$

Submit Request Answer

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Mastering Physics Answer Key Chapter 2 provides essential insights and solutions that can significantly enhance a student's understanding of fundamental physics concepts. This chapter typically encompasses key topics such as kinematics, motion in one dimension, and the fundamental principles that govern the behavior of objects in motion. As students delve into the intricacies of these concepts, having access to a reliable answer key can streamline their study process, bolster their problem-solving skills, and prepare them for more advanced topics in physics.

Overview of Chapter 2: Kinematics

Chapter 2 of Mastering Physics primarily focuses on kinematics, which is the branch of mechanics that describes the motion of objects without considering the forces that cause the motion.

Understanding kinematics is crucial for students as it lays the groundwork for more complex topics such as dynamics and energy.

Key Concepts in Kinematics

1. **Displacement:** This refers to the change in position of an object. It is a vector quantity, meaning it has both magnitude and direction.
2. **Velocity:** Defined as the rate of change of displacement, velocity is also a vector quantity. It can be average or instantaneous.
3. **Acceleration:** This is the rate of change of velocity over time. Acceleration can also be positive, negative (deceleration), or zero.
4. **Graphs of Motion:** Understanding how to interpret and create position-time and velocity-time graphs is essential in analyzing motion.

Utilizing the Answer Key for Mastery

The Mastering Physics Answer Key for Chapter 2 serves as an invaluable resource for students as they navigate through exercises and problems related to kinematics. By referencing the answer key, students can check their work, understand where they went wrong, and reinforce concepts through guided explanations.

Benefits of Using the Answer Key

- **Immediate Feedback:** Students can quickly determine the correctness of their answers and gain insights into their thought processes.
- **Problem-Solving Techniques:** The answer key often highlights various methods to approach a problem, enhancing critical thinking and analytical skills.
- **Clarification of Concepts:** If a student struggles with a particular concept, the answer key usually includes detailed explanations that clarify misunderstandings.

Common Topics Covered in Chapter 2

In Mastering Physics Chapter 2, several foundational topics are typically explored. Understanding these topics not only prepares students for exams but also provides them with practical applications of physics in real-world scenarios.

1. The Concept of Motion

Motion is a fundamental concept in physics that describes the change in position of an object over time. The chapter typically covers:

- Types of motion: linear, rotational, periodic, and random motion.
- The significance of reference points and frames of reference in analyzing motion.

2. Equations of Motion

Students learn to use key equations that relate displacement, velocity, acceleration, and time. The primary equations often discussed include:

- $v = u + at$
- $s = ut + \frac{1}{2}at^2$
- $v^2 = u^2 + 2as$

Where:

- u = initial velocity
- v = final velocity
- a = acceleration
- s = displacement
- t = time

3. Free Fall and Gravity

The chapter often includes discussions on free fall, where the only force acting on an object is gravity. Key points include:

- The acceleration due to gravity (approximately 9.81 m/s^2).
- The impact of air resistance on falling objects.
- Calculating the time it takes for an object to reach the ground when dropped from a certain height.

4. Motion Graphs

Graphs are a vital tool in physics, providing a visual representation of an object's motion. The chapter covers:

- Position-time graphs: Understanding the slope and what it indicates about velocity.
- Velocity-time graphs: Interpreting areas under the curve to find displacement.

How to Effectively Use the Answer Key

While the answer key is a powerful tool, students should utilize it strategically to maximize their learning experience. Here are some tips:

1. Attempt Problems Independently

Before consulting the answer key, students should try to solve problems on their own. This practice reinforces learning and improves problem-solving skills.

2. Analyze Incorrect Answers

When students check their answers, they should focus on understanding their mistakes rather than simply correcting them. This analysis can reveal gaps in understanding and lead to deeper learning.

3. Use the Explanations

The explanations provided in the answer key can serve as a mini-tutorial. Students should read through these explanations carefully, especially for problems they found challenging.

4. Practice with Variety

Students should not limit themselves to the problems in the textbook. Supplementing their study with additional practice problems can help solidify their understanding of the concepts.

Conclusion

Mastering Physics Answer Key Chapter 2 is an essential resource in the journey of learning kinematics. By understanding core concepts such as displacement, velocity, and acceleration, students can build a strong foundation that prepares them for future studies in physics. Utilizing the answer key effectively will not only enhance their grasp of the material but also cultivate a strong analytical mindset that is invaluable in the study of science. Physics is not just about solving equations; it's about understanding the world around us and developing a curiosity to explore it further.

Frequently Asked Questions

What are the key concepts covered in Chapter 2 of Mastering Physics?

Chapter 2 typically covers topics such as kinematics, including displacement, velocity, acceleration, and the equations of motion for uniformly accelerated objects.

How can I access the answer key for Chapter 2 in Mastering Physics?

The answer key for Chapter 2 can usually be accessed by logging into your Mastering Physics account and navigating to the specific chapter or by consulting your course materials provided by your instructor.

Are the solutions in the Mastering Physics answer key comprehensive?

Yes, the solutions in the Mastering Physics answer key are typically comprehensive, providing step-by-step explanations for problems to help students understand the underlying concepts.

Can I find additional resources to help understand Chapter 2 concepts in Mastering Physics?

Yes, in addition to the answer key, Mastering Physics often provides supplementary resources like tutorials, videos, and practice problems to reinforce the learning of Chapter 2 concepts.

What types of problems can I expect in Chapter 2 of Mastering Physics?

In Chapter 2, you can expect problems involving calculating displacement, understanding graphs of motion, solving for unknown variables in kinematic equations, and applying concepts to real-world scenarios.

Is it beneficial to work through the problems in Chapter 2 before checking the answer key?

Yes, working through the problems independently before checking the answer key is beneficial as it enhances problem-solving skills and deepens your understanding of the material.

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