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FULL MEMORANDUM GRADE 12 PHYSICS 2022 FINAL

This question paper consists of 18 pages and 3 data sheets.

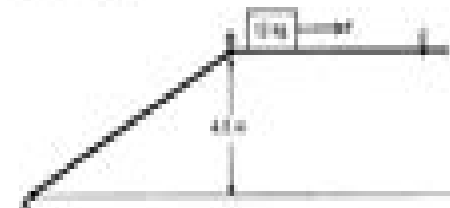
(QUESTION 5 (Start on a new page.)

A 12 kg block is initially at rest at point A at the bottom of a ROUGH inclined plane. The block is pulled up the incline by a constant force F acting parallel to the incline. The block reaches point B, which is at a vertical height of 4.0 m above the horizontal, with a speed of 2.00 m/s. See the diagram below.



- 5.1 Define the term non-conservative force.
- 5.2 Draw a labelled free-body diagram for the block when it is pulled up the incline.
- 5.3 Calculate the total work done on the block by the NON-CONSERVATIVE forces when the block moves from point A to point B. (4)

The same constant force F now moves the block at a CONSTANT VELOCITY across a rough horizontal surface from point B to point C, as shown below. Force F acts parallel to the horizontal surface.



The magnitude of the constant frictional force acting on the block while moving from point B to point C is 40 N, 40% greater than the magnitude of the constant frictional force acting on the block when it moves from point A to point B.

- 5.4 Calculate the distance from point A to point B. (5)

(14)

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Table of Contents Physical Science Paper1 June 2013 Memorandum

1. Understanding the eBook Physical Science Paper1 June 2013 Memorandum
 - The Rise of Digital Reading Physical Science Paper1 June 2013 Memorandum
 - Advantages of eBooks Over Traditional Books
2. Identifying Physical Science Paper1 June 2013 Memorandum
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Physical Science Paper1 June 2013 Memorandum
 - User-Friendly Interface
4. Exploring eBook Recommendations from Physical Science Paper1 June 2013 Memorandum
 - Personalized Recommendations
 - Physical Science Paper1 June 2013 Memorandum User Reviews and Ratings
 - Physical Science Paper1 June 2013 Memorandum and Bestseller Lists
5. Accessing Physical Science Paper1 June 2013 Memorandum Free and Paid eBooks
 - Physical Science Paper1 June 2013 Memorandum Public Domain eBooks
 - Physical Science Paper1 June 2013 Memorandum eBook Subscription Services
 - Physical Science Paper1 June 2013 Memorandum Budget-Friendly Options

6. Navigating Physical Science Paper1 June 2013 Memorandum eBook Formats
 - ePub, PDF, MOBI, and More
 - Physical Science Paper1 June 2013 Memorandum Compatibility with Devices
 - Physical Science Paper1 June 2013 Memorandum Enhanced eBook Features
7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Physical Science Paper1 June 2013 Memorandum
 - Highlighting and Note-Taking Physical Science Paper1 June 2013 Memorandum
 - Interactive Elements Physical Science Paper1 June 2013 Memorandum
8. Staying Engaged with Physical Science Paper1 June 2013 Memorandum
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Physical Science Paper1 June 2013 Memorandum
9. Balancing eBooks and Physical Books Physical Science Paper1 June 2013 Memorandum
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Physical Science Paper1 June 2013 Memorandum
10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
11. Cultivating a Reading Routine Physical Science Paper1 June 2013 Memorandum
 - Setting Reading Goals Physical Science Paper1 June 2013 Memorandum
 - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of Physical Science Paper1 June 2013 Memorandum
 - Fact-Checking eBook Content of Physical Science Paper1 June 2013 Memorandum
 - Distinguishing Credible Sources
13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
14. Embracing eBook Trends
 - Integration of Multimedia Elements

- Interactive and Gamified eBooks

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