



PROBLEM 14.40

A 40-lb block B is suspended from a 6-ft cord attached to a 60-lb cart A , which may roll freely on a frictionless, horizontal track. If the system is released from rest in the position shown, determine the velocities of A and B as B passes directly under A .

SOLUTION

Conservation of linear momentum:

Since block and cart are initially at rest,

$$\mathbf{L}_0 = 0$$

Thus, as B passes under A ,

$$\mathbf{L} = m_A \mathbf{v}_A + m_B \mathbf{v}_B = 0$$

$$\rightarrow +, m_A v_A + m_B v_B = 0$$

$$v_A = -\frac{m_B}{m_A} v_B$$

(1)

Conservation of energy:

Initially,

$$T_0 = 0$$

$$V_0 = m_B g l (1 - \cos \theta)$$

As B passes under A ,

$$T = \frac{1}{2} m_A v_A^2 + \frac{1}{2} m_B v_B^2$$

$$V = 0$$

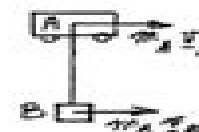
Thus,

$$T_0 + V_0 = T + V: m_B g l (1 - \cos \theta) = \frac{1}{2} m_A v_A^2 + \frac{1}{2} m_B v_B^2$$

Substituting for v_A from (1) and multiplying by 2:

$$\begin{aligned} 2m_B g l (1 - \cos \theta) &= m_A \left(\frac{m_B^2}{m_A^2} v_B^2 \right) + m_B v_B^2 \\ &= \left(\frac{m_B^2}{m_A} + m_B \right) v_B^2 = m_B \frac{m_B + m_A}{m_A} v_B^2 \\ v_B &= \sqrt{\frac{2m_A}{m_A + m_B} g l (1 - \cos \theta)} \end{aligned}$$

(2)



Vector 12 Supplement Solution Manual

Jiyuan Zhang



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The NASTRAN User's Manual, Level L6.0 Supplement United States. National Aeronautics and Space Administration, 1976 Baculovirus Expression Vectors David R. O'Reilly, Lois K. Miller, Verne A. Luckow, 1994 Baculoviruses have proven to be the most powerful and versatile eukaryotic expression vectors available This unique laboratory manual is designed to help both beginning and experienced researchers construct and use baculovirus vector systems It simplifies selection of the most appropriate baculovirus vector design for a given problem then describes each step of the implementation process from vector construction to large scale protein production The book provides an understanding of how the vectors work a biological overview of cells viruses plasmids and promoters guidelines for choosing optimum vectors protocols for growing insect cells and recombinant viruses methods of analyzing protein products and scaling up protein production techniques for producing proteins in insect larvae and easy to use maps charting available expression vectors This comprehensive approach has many benefits for researchers and students alike It allows them to understand how and why the vector system works and offers a rapid comparison of options for choosing the right virus plasmid or promoter for vector design and construction with a minimum amount of lost time The manual is an invaluable resource for every individual engaged in the production of proteins for any purpose Mathcad Manual for Statistics Soutas-Little & Inman, 1999

Fundamentals of Physics, Part 1, Chapters 1 - 12 David Halliday, Robert Resnick, 2000-01-21 The primary goal of this text is to provide students with a solid understanding of fundamental physics concepts and to help them apply this conceptual understanding to quantitative problem solving *The Molecular Biology of Insect Disease Vectors* J.M. Crampton, C.B. Beard, C. Louis, 2012-12-06 Only one generation ago entomology was a proudly isolated discipline In Comstock Hall the building of the Department of Entomology at Cornell University where I was first introduced to experimental science in the laboratory of Tom Eisner those of us interested in the chemistry of life felt like interlopers In the 35 years that have elapsed since then all of biology has changed and entomology with it Arrogant molecular biologists and resentful classical biologists might think that what has happened is a hostile take over of biology by molecular biology But they are wrong More and more we now understand that the events were happier and much more exciting amounting to a new synthesis Molecular Biology which was initially focused on the simplest of organisms bacteria and viruses broke out of its confines after the initial fundamental questions were answered the structure of DNA the genetic code the nature of regulatory genes and importantly as its methods became more and more generally applicable The recombinant DNA revolution of the 1970s the development of techniques for sequencing macromolecules the polymerase chain reaction new molecular methods of genetic analysis all brought molecular biology face to face with the infinite complexity and the exuberant diversity of life Molecular biology itself stopped being an isolated discipline pre occupied with the universal laws of life and became an approach to addressing fascinating specific problems from every field of biology Technical Abstract Bulletin , Books in Print Supplement , 1985

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 States. Energy Research and Development Administration,1976 **Resources in Education** ,1980 *Physico-Chemical*
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