

National Year of Mathematics

It is not often realised how much the world is indebted to India for mathematics

C. R. RAJU



The Prime Minister has declared 2012 as the National Year of Mathematics. The terrible irony in this ought to be widely known.

First, we need some history. Europeans learnt basic arithmetic (algorithms for addition, multiplication, division, square roots, etc.) from India. Indian arithmetic was famous for its efficiency: it is ascribed to Baghdad, where al-Khwarizmi wrote a book *Hisab al-Hind* in the 9th century. Europeans called this technique *Algorithmus* (after al-Khwarizmi's Latinized name). Florentine merchants understood that superior arithmetic gives a comparative advantage in commerce. Europeans eventually accepted the algorithmus, rejecting as inferior the primitive *abacus* they earlier used.

Earlier, European ignorance of arithmetic is also reflected in their crude calendar. The year and months are based on the solar and lunar cycles, both of which involve fractions of days. But precise fractions cannot be readily written in Roman numerals. So, Europeans could not articulate the correct lengths of the months and the year. Instead, they pondered to the vanity of Rome an emperor by adding extra days to July and August to honor Julius and Augustus Caesar. These days were pinched from February. The result

is a thoroughly unscientific calendar with months of 28, 29, 30, and 31 days, unrelated to the cycle of the moon after which the month is named. Because Romans knew only a few simple fractions (like $\frac{1}{2}$) they wrongly stated the length of the (tropical) year as 365 $\frac{1}{4}$ days. This was hopeless even by contemporary standards in the 3rd century. Surya Siddhanta in India and the 9th century, Aryabhata both give far more precise fractions for the length of the (sidereal) year.

This inferior Roman calendar became the Christian religious calendar, used to fix the date of Easter, then the key Christian festival, which depends upon the full moon. Because of the wrong length of the year, the dates of Easter kept slipping. The church repeatedly tried to reform the calendar, but failed. The church then had full control over Alexandria, so these failures prove that the Alexandrian Greeks then lacked good knowledge of astronomy, not withstanding the tall Western claims made on their behalf today. Those claims are based on the book called *Almagest*, which, like any scientific text, is accretive. Though it gives a better length of the (tropical) year, even that inaccurate later-day figure was never incorporated in the Roman calendar. The sixth-century calendar reforms by Dionysius Exiguus only retrospectively fixed the zero point of this calendar, which later somehow got related to the birth of Jesus due to the use of the terms A.D. and B.C.

In contrast, the Indian calendar had critical practical applications. It was in this connection that calculus was invented in the 5th century by Aryabhata, a low caste mathematician from Patna. Aryabhata used the calculus to calculate sine values accurate to five decimal



places. This tradition was carried forward by the Aryabhata school in Kerala, which involved the highest caste Namboodiri Brahmins, transcending north-south and caste differences. Over the next thousand years they calculated trigonometric values accurate to the 9th decimal place. Why did Indians need this phenomenal precision? What social need did it fulfil? The simple answer is this: the Indian economy depended on rain-fed agriculture. That required a good calendar to synchronize agricultural operations with the rainy season. Constructing such a calendar, which could tell the rainy season, required accurate astronomical models and accurate trigonometric values. The other source of wealth in India was overseas trade, which too required accurate trigonometric values for navigation.

In the 16th century, the European navigation problem was the key scientific challenge. Its solution needed accurate trigonometric values. Hence, calculus texts of the Aryabhata school in Kerala were translated and imported into Europe by Jesuits based in Coch-

in. Europeans then found it difficult to fix even latitude at sea, because their calendar gave the wrong date of equinox. Matteo Ricci, who was in India, provided inputs to his teacher Christoph Clavius who authored the Gregorian calendar reforms of 1582. Common Europeans were still uncomfortable with fractions, so that reform corrected the length of the year, not by stating it as an accurate fraction, but by an ad hoc system of leap years! It also cut out ten whole days which had piled up due to the error in the Christian calendar. Though Clavius published (in his name) trigonometric tables based on the Indian values, accurate to the 9th decimal place, he did not know even the elementary trigonometry required to determine the size of the earth! That was accurately known in India from before Aryabhata, and Caliph al-Mansur had confirmed it by direct measurement in the 9th century. Columbus, however, underestimated the size of the earth bringing it down to 40 per cent of the correct Indo-Arabic figure, to facilitate funding for his project of sailing west to

go east. Consequently, Europeans then could not determine longitude at sea either – a problem they solved only in the late 18th century.

Westerners consistently wrote history to glorify themselves and belittle non-Christians, so they never acknowledged learning calculus from India. For centuries, the calculus was attributed to Newton and Leibniz. This false history was a source of political power: it was used by the Whig historian Macaulay to assert Western superiority and institute Western education in India, facilitating colonisation.

Naturally, the Western-educated learn the Gregorian calendar and the A.D/B.C. superstition. Most Western 'educated' Indians cannot even name the months on the Indian calendar. Since Indian festivals are fixed by the Indian calendar, but move on the Gregorian calendar, this invites cultural alienation – few know how to fix the date of Diwali, for example. The most tragic contemporary consequences are in agriculture, for the Gregorian calendar has no concept of a rainy season, like *Sawan* and *Shadon* on the Indian calendar. Several times in the last decade, the monsoons were delayed on the Gregorian calendar. False anticipation of drought was followed by floods, in 2003, 2004, and 2009. But the rains arrived in time on the Indian calendar.

So, was the monsoon delayed or is the calendar wrong? Anyway, the poorer farmers were ruined because they credulously believed the 'experts' and mistimed operations.

It is, therefore, ironic that the 'National Year of Mathematics' is a year on the Western calendar.

The author is Professor of mathematics at the University of Science Malaysia

Maths Articles In Newspaper

SJ Ball



Maths Articles In Newspaper

Chemistry Final Exam Review (Hanover Horton High School) Start studying Chemistry Final Exam Review (Hanover Horton High School). Learn vocabulary, terms, and more with flashcards, games, and other study tools. CHEMISTRY TEST REVIEW OVER MOLES UNIT Moles Practice Test At STP, which sample contains the same number of molecules as 11.2 liters of CO₂(g) at STP? Page 4. Answer Key moles practice test. 1. C. 2. C. 3. D. 4. C. 5. A. Nadeb videos 6 years ago. 1:25. Nadeb. Mole Test Review Answer Key Horton High School. 6 years ago. 1:25. Nadeb. How To Replace Drive Belt On Yamaha Stratoliner. 6 years ago. Stoichiometry Review Sheets 2.pdf X moles = 399. 26. LIFE 7+ 19. Page 7. Name: Answer Key. 1. Base your answer to ... Determine the total number of moles of CO₂ produced during the lantern test. Relative Mass and the Mole answer key Use a periodic table to answer the following questions. a. Fluorine gas consists of diatomic molecules of fluorine (F). How many molecules of fluorine are in ... Conceptual Chemistry MOLES & EMPIRICAL FORMULA ... May 5, 2020 — Conceptual Chemistry MOLES & EMPIRICAL FORMULA Test Review 1. A mole is equal to : representative particles grams liters (for gases only) 2. Msrazz chem class the mole answer key ... mole answer key Balancing combustion Chemistry test review answers - earthstaff. ... High School chemistry is one of the most high-yield areas for study. pogil ... Gif Dr Doe is here to test your knowledge of chemistry! Answer correctly, she strips. Made using the Topaz Gigapixel AI 5. Stay on topic, be respectful, no low ... Answers to Even- Numbered Exercises 9. Experiment with the xman utility to answer the following questions: a. How many man pages are in the Devices section of the manual? Answers to Odd-Numbered Problems CHAPTER 1. Exercises 1.1. 1. (a) ordinary, first order. (c) partial, second order. (e) ordinary, third order. (g) ordinary, second order. Answers to Even-Numbered Exercises How can you keep other users from using write to communicate with you? Why would you want to? Give the command mesg n to keep ordinary users from writing to ... Why do some science or math books only have answers ... Jan 30, 2015 — Some science and math books only provide answers to odd or even numbered questions as a way to encourage students to practice ... MARK G. SOBELL A PRACTICAL GUIDE TO LINUX ... by MG SOBELL · 2013 · Cited by 55 — ... EXERCISES. 1. The following message is displayed when you attempt to log in with an incorrect username or an incorrect password: Page 81. ADVANCED EXERCISES ... ANSWERS TO EVEN-NUMBERED EXERCISES - Sobell Jul 27, 2013 — Answers to Even-numbered Exercises
. 1. Wile?
. 2. What does the /etc/resolv.conf file do? What do the nameserver lines in
. 1 Answers to Chapter 3, Odd-numbered Exercises 1 Answers to Chapter 3, Odd-numbered Exercises. 1) $r(n) = 25r(n - 1) + 3r(n - 2) + 10n - 1$. There are $25r(n - 1)$ identifiers satisfying the first condition, $3r ...$ Vim Question - Single command to swap words Jan 5, 2012 — Hi, I'm working through Sobell's book Linux Commands, Editors and Shell ... odd-numbered exercises (for which he does not publish the answers). Why do textbooks often include the

solutions to odd or ... Jun 18, 2019 — My question is, why do textbooks often include the solutions to odd or even numbered problems but not both? In my case, I don't think space is ...

1. AB Calculus - Step-by-Step Name Write, but do not solve, an equation involving an integral expression whose solution k would be the number of days the height of the snow would be half of its ... Step by Step Student Let f be a twice-differentiable function defined on the interval $0.5 < x < 4.5$ with $f(2) = 3$. The graph of f , the derivative of f is shown to the right.

70. AB Calculus - Step-by-Step Name Stu Schwartz. 70. AB Calculus - Step-by-Step. Name ... Describe the region in the xy -plane in which all the solutions to the differential equation are concave ... ABReview Stu Schwartz AB Calculus Exam - Review Sheet - Solutions. A. Precalculus Type problems ... $f(x)$. Step 1: Find $f'(a)$. If you get a zero in the denominator, . Step 2 ... Diff EQ Practice.pdf - 70. AB Calculus - Step-by-Step Name View Diff_EQ_Practice.pdf from MATH 1300 at Brooklyn College, CUNY. 70. AB Calculus - Step-by-Step Name _ Consider the differential equation $dy + 1 = . dx$... AB Calculus Manual (Revised 12/2019) This manual can easily replace an expensive textbook. Teachers teach right from it and students write in it. The Solution Manual is exactly the same as the ... AB Calculus - Step-by-Step - 24. Function Analysis There is a relative maximum at $x=2$ as f' switches from positive to negative. b. On what intervals is the graph of f concave upward? Justify your answers. (2). img-X26071655-0001 - 24. AB Calculus Step-by- ... View img-X26071655-0001 from MATH 2215 at Cameron University. 24. AB Calculus Step-by-Step Name The gure to the right shows the graph of f , the derivative ... MasterMathMentor AB31 - Definite Integrals with u-Substitution MMM AB Calculus MasterMath Mentor AB0102 - Intro to Calculus / Tangent line problem. Stu Schwartz · 28:56. MasterMathMentor AB03 - Rates of Change.

Embark on a breathtaking journey through nature and adventure with Explore with is mesmerizing ebook, **Maths Articles In Newspaper** . This immersive experience, available for download in a PDF format (PDF Size: *), transports you to the heart of natural marvels and thrilling escapades. Download now and let the adventure begin!

https://offsite.creighton.edu/files/virtual-library/Documents/how_to_make_a_cda_portfolio.pdf

https://offsite.creighton.edu/files/virtual-library/Documents/how_to_program_a_microprocessor.pdf

https://offsite.creighton.edu/files/virtual-library/Documents/how_to_keep_score_for_softball.pdf

Table of Contents Maths Articles In Newspaper

1. Understanding the eBook Maths Articles In Newspaper
 - The Rise of Digital Reading Maths Articles In Newspaper
 - Advantages of eBooks Over Traditional Books
2. Identifying Maths Articles In Newspaper
 - 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 Maths Articles In Newspaper
 - User-Friendly Interface
4. Exploring eBook Recommendations from Maths Articles In Newspaper
 - Personalized Recommendations
 - Maths Articles In Newspaper User Reviews and Ratings

- Maths Articles In Newspaper and Bestseller Lists
- 5. Accessing Maths Articles In Newspaper Free and Paid eBooks
 - Maths Articles In Newspaper Public Domain eBooks
 - Maths Articles In Newspaper eBook Subscription Services
 - Maths Articles In Newspaper Budget-Friendly Options
- 6. Navigating Maths Articles In Newspaper eBook Formats
 - ePub, PDF, MOBI, and More
 - Maths Articles In Newspaper Compatibility with Devices
 - Maths Articles In Newspaper Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Maths Articles In Newspaper
 - Highlighting and Note-Taking Maths Articles In Newspaper
 - Interactive Elements Maths Articles In Newspaper
- 8. Staying Engaged with Maths Articles In Newspaper
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Maths Articles In Newspaper
- 9. Balancing eBooks and Physical Books Maths Articles In Newspaper
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Maths Articles In Newspaper
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine Maths Articles In Newspaper
 - Setting Reading Goals Maths Articles In Newspaper
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Maths Articles In Newspaper
 - Fact-Checking eBook Content of Maths Articles In Newspaper
 - 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

Maths Articles In Newspaper Introduction

In this digital age, the convenience of accessing information at our fingertips has become a necessity. Whether its research papers, eBooks, or user manuals, PDF files have become the preferred format for sharing and reading documents. However, the cost associated with purchasing PDF files can sometimes be a barrier for many individuals and organizations. Thankfully, there are numerous websites and platforms that allow users to download free PDF files legally. In this article, we will explore some of the best platforms to download free PDFs. One of the most popular platforms to download free PDF files is Project Gutenberg. This online library offers over 60,000 free eBooks that are in the public domain. From classic literature to historical documents, Project Gutenberg provides a wide range of PDF files that can be downloaded and enjoyed on various devices. The website is user-friendly and allows users to search for specific titles or browse through different categories. Another reliable platform for downloading Maths Articles In Newspaper free PDF files is Open Library. With its vast collection of over 1 million eBooks, Open Library has something for every reader. The website offers a seamless experience by providing options to borrow or download PDF files. Users simply need to create a free account to access this treasure trove of knowledge. Open Library also allows users to contribute by uploading and sharing their own PDF files, making it a collaborative platform for book enthusiasts. For those interested in academic resources, there are websites dedicated to providing free PDFs of research papers and scientific articles. One such website is Academia.edu, which allows researchers and scholars to share their work with a global audience. Users can download PDF files of research papers, theses, and dissertations covering a wide range of subjects. Academia.edu also provides a platform for discussions and networking within the academic community. When it comes to downloading Maths Articles In Newspaper free PDF files of magazines, brochures, and catalogs, Issuu is a popular choice. This digital publishing platform hosts a vast collection of publications from around the world. Users can search for specific titles or explore various categories and genres. Issuu offers a seamless reading experience with its user-friendly interface and allows users to download PDF files for offline reading. Apart from dedicated platforms, search engines also play a crucial role in finding free PDF files. Google, for instance, has an advanced search feature that allows users to filter results by file type. By specifying the file type as "PDF," users can find websites that

offer free PDF downloads on a specific topic. While downloading Maths Articles In Newspaper free PDF files is convenient, its important to note that copyright laws must be respected. Always ensure that the PDF files you download are legally available for free. Many authors and publishers voluntarily provide free PDF versions of their work, but its essential to be cautious and verify the authenticity of the source before downloading Maths Articles In Newspaper. In conclusion, the internet offers numerous platforms and websites that allow users to download free PDF files legally. Whether its classic literature, research papers, or magazines, there is something for everyone. The platforms mentioned in this article, such as Project Gutenberg, Open Library, Academia.edu, and Issuu, provide access to a vast collection of PDF files. However, users should always be cautious and verify the legality of the source before downloading Maths Articles In Newspaper any PDF files. With these platforms, the world of PDF downloads is just a click away.

FAQs About Maths Articles In Newspaper Books

What is a Maths Articles In Newspaper PDF? A PDF (Portable Document Format) is a file format developed by Adobe that preserves the layout and formatting of a document, regardless of the software, hardware, or operating system used to view or print it. **How do I create a Maths Articles In Newspaper PDF?** There are several ways to create a PDF: Use software like Adobe Acrobat, Microsoft Word, or Google Docs, which often have built-in PDF creation tools. Print to PDF: Many applications and operating systems have a "Print to PDF" option that allows you to save a document as a PDF file instead of printing it on paper. Online converters: There are various online tools that can convert different file types to PDF. **How do I edit a Maths Articles In Newspaper PDF?** Editing a PDF can be done with software like Adobe Acrobat, which allows direct editing of text, images, and other elements within the PDF. Some free tools, like PDFescape or Smallpdf, also offer basic editing capabilities. **How do I convert a Maths Articles In Newspaper PDF to another file format?** There are multiple ways to convert a PDF to another format: Use online converters like Smallpdf, Zamzar, or Adobe Acrobats export feature to convert PDFs to formats like Word, Excel, JPEG, etc. Software like Adobe Acrobat, Microsoft Word, or other PDF editors may have options to export or save PDFs in different formats. **How do I password-protect a Maths Articles In Newspaper PDF?** Most PDF editing software allows you to add password protection. In Adobe Acrobat, for instance, you can go to "File" -> "Properties" -> "Security" to set a password to restrict access or editing capabilities. Are there any free alternatives to Adobe Acrobat for working with PDFs? Yes, there are many free alternatives for working with PDFs, such as: LibreOffice: Offers PDF editing features. PDFsam: Allows splitting, merging, and editing PDFs. Foxit Reader: Provides basic PDF viewing and editing capabilities. How do I compress a PDF file? You can use online tools like Smallpdf, ILovePDF, or desktop software like Adobe Acrobat to compress PDF files without significant quality loss. Compression reduces the file size,

making it easier to share and download. Can I fill out forms in a PDF file? Yes, most PDF viewers/editors like Adobe Acrobat, Preview (on Mac), or various online tools allow you to fill out forms in PDF files by selecting text fields and entering information. Are there any restrictions when working with PDFs? Some PDFs might have restrictions set by their creator, such as password protection, editing restrictions, or print restrictions. Breaking these restrictions might require specific software or tools, which may or may not be legal depending on the circumstances and local laws.

Find Maths Articles In Newspaper :

how to make a cda portfolio

how to program a microprocessor

how to keep score for softball

how to describe a dad

how to get flat belly after pregnancy

how to find holes in algebra 2

how to survive as an empath

~~how to interview an executive assistant~~

how to memorize rules for bar exam

how to create a student behavior contract

how to get a chauffeur license in michigan

~~how to make a grimoire~~

how to find the molarity of a diluted solution

~~how to do mole to mole conversions~~

how to read the summer i turned pretty

Maths Articles In Newspaper :