

National Year of Mathematics

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

C. R. RAJ



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 *Algorismus* (after al-Khwarizmi's Latinized name). Florentine merchants understood that superior arithmetic gives a comparative advantage in commerce. Europeans eventually accepted the *algorismus*, 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 honour 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 $\frac{1}{4}$) they wrongly stated the length of the (tropical) year as 365 $\frac{1}{4}$ days. This was hopeless even by contemporary standards: the 3rd century Surya Siddhanta in India and the 9th century Aryabhata both gave 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 8th 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 synchronise 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 Cochin.

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 Sowing and Bhadon 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

Sue Howarth, Linda Scott



Maths Articles In Newspaper:

Breaking Images Brian Greer, David Kollosche, Ole Skovsmose, 2024-12-11 Mathematics is an activity something we do not just something inert that we study This rich collection begins from that premise to explore the various social influences institutional forces and lived realities that shape and mould the study and practice of mathematics and are moulded by it in turn These twenty one essays explore questions of mathematics as a topic of philosophy but also the nature and purpose of mathematics education and the role of mathematics in moulding citizens It challenges the biases and prejudices inherent within uninformed histories of mathematics including problems of white supremacy the denial of cultural difference and the global homogenization of teaching methods In particular the book contrasts the effectiveness of mathematics and science in modelling physical phenomena and solving technical problems with its ineffectiveness in modelling social phenomena and solving human problems and urges us to consider how mathematics might better meet the urgent crises of our age The book addresses anybody who is interested in reflecting on the role of mathematics in society from different perspectives It allows mathematicians to ponder about the cultural connections of mathematics and provides new perspectives for philosophical sociological and cultural studies of mathematics Because of the book's emphasis on education in mathematics it is especially interesting for mathematics teachers and teacher educators to challenge their understanding of the subject **Math**

Mutation Classics Erik Seligman, 2016-04-22 Use math in unique ways to analyze things you observe in life and use proof to attain the unexpected There is quite a wide diversity of topics here and so all age levels and ability levels will enjoy the discussions You'll see how the author's unique viewpoint puts a mathematical spin on everything from politicians to hippos Along the way you will enjoy the different point of view and hopefully it will open you up to a slightly more out of the box way of thinking Did you know that sometimes $2 + 2$ equals 5 That wheels don't always have to be round That you can mathematically prove there is a hippopotamus in your basement Or how to spot four dimensional beings as they pass through your kitchen If not then you need to read this book Math Mutation Classics is a collection of Erik Seligman's blog articles from Math Mutation at MathMutation.com Erik has been creating podcasts and converting them in his blog for many years Now he has collected what he believes to be the most interesting among them and has edited and organized them into a book that is often thought provoking challenging and fun What You Will Learn View the world and problems in different ways through math Apply mathematics to things you thought unimaginable Abstract things that are not taught in school Who this Book is For Teenagers college level students and adults who can gain from the many different ways of looking at problems and feed their interest in mathematics **Schoolteachers in the News** Kathryn Shine, Tom O'Donoghue, 2013-02-28

Research examining how schoolteachers have been represented in the news is scarce This is noteworthy given the recognition that the news media has an influential agenda setting function plays a pivotal role in shaping public opinion and can influence educational policy Indeed there is a view amongst some authorities that education policy and news media

coverage are irrevocably interconnected Specifically in relation to newspapers research indicates that their coverage can be particularly influential in informing and influencing public debate and policy about a variety of educational issues Research has also been conducted on the reactions of teachers reporting that they perceive news media coverage as important in shaping public opinion and education policy as well as affecting their relationships with families friends and the community Teachers in various countries have also expressed frustration at what they have perceived as a negative focus in coverage Furthermore news media coverage has been seen to play a role to the decline in the status of teaching that has been documented by researchers from many developed countries over the past three decades It has been claimed that contemporary news media coverage has led to greater scrutiny and criticism of the teaching profession than ever before with educators increasingly having to explain and justify their work In addition to the widespread concern about the decline in the status of teaching many countries are experiencing ongoing teacher recruitment and retention problems Despite this very few studies have considered how schoolteachers and teaching as a profession are depicted in the news media Particularly scarce are investigations with a historical dimension This book helps fill the gap by examining the reporting in The West Australian newspaper one of the oldest newspapers in Australia and a daily publication since 1885 It is offered as a contribution towards rectifying the deficit in the corpus of work on how newspapers have depicted teachers and points the way towards one of a number of avenues of research that other scholars in the field could take for various contexts including different countries and time periods The specific aim of the study is to provide a historical analysis of The West Australian newspaper's representation of teachers over two decades To that end it examines the portrayal of teachers in its reporting of five major educational developments in the state of Western Australia that were the subject of sustained coverage at various times between 1987 and 2007 unit curriculum 1987 1989 industrial dispute 1995 standardised testing 1997 2001 teacher shortage 1997 2007 and outcomes based education 2005 2007 Although the study focused on The West Australian newspaper the topics chosen reflect the international trends and universal issues in education Each of the topics in the study is located within the broader context of related developments internationally and especially in the United States the United Kingdom and Australia Three key representations of teachers are identified negative representations sympathetic representations and positive representations The negative representations refer to coverage which is overtly critical of teachers such as reporting which condemns teachers for taking industrial action the sympathetic representations relate to reporting which typically presents teachers as stressed overburdened and powerless and the positive representations show teachers as valued by the community and devoted to their students and work The central argument of the study is that The West Australian's coverage was dominated by both negative and sympathetic representations of schoolteachers while positive representations were relatively rare Overall the coverage presented a less flattering image of teachers than that which emerges from the educational research literature yet it provided a more balanced presentation of teachers than the

extremes of hero and villain which tend to dominate popular culture Its portrayal of teachers was generally consistent with that of other news media with a movement towards a more sympathetic treatment in recent reporting reflecting a trend also identified in contemporary British newspaper coverage Although the sympathetic coverage did recognize the challenges faced by teachers it consistently presented teaching as a profession in a negative light Across the coverage there was almost a total absence of voices defending teaching or presenting it as an attractive career option In addition comments of any type from individual teachers were rare Overall the book highlights the need for key media spokespeople in education politicians union representatives bureaucrats and academics to consider carefully the messages they want to send regarding teachers and teaching It also points to implications for journalism education and journalism practice This book should be read by those working in the fields of educational policy journalism education media studies and history of education internationally particularly those working in these fields in the United States Canada the United Kingdom Australia and New Zealand

Mathematical Publishing Steven George Krantz, Mathematicians are expected to publish their work in journals conference proceedings and books It is vital to advancing their careers Later some are asked to become editors However most mathematicians are trained to do mathematics not to publish it But here finally for graduate students and researchers interested in publishing their work Steven G Krantz the respected author of several how to guides in mathematics shares his experience as an author editor editorial board member and independent publisher This new volume is an informative comprehensive guidebook to publishing mathematics Krantz describes both the general setting of mathematical publishing and the specifics about all the various publishing situations mathematicians may encounter As with his other books Krantz s style is engaging and frank He gives advice on how to get your book published how to get organized as an editor what to do when things go wrong and much more He describes the people the language including a glossary and the process of publishing both books and journals Steven G Krantz is an accomplished mathematician and an award winning author He has published more than 130 research articles and 45 books He has worked as an editor of several book series research journals and for the Notices of the AMS He is also the founder of the Journal of Geometric Analysis Other titles available from the AMS by Steven G Krantz are How to Teach Mathematics A Primer of Mathematical Writing A Mathematician s Survival Guide and Techniques of Problem Solving

Maths Meets Myths: Quantitative Approaches to Ancient Narratives Ralph Kenna, Máirín MacCarron, Pádraig MacCarron, 2016-09-22 With an emphasis on exploring measurable aspects of ancient narratives Maths Meets Myths sets out to investigate age old material with new techniques This book collects for the first time novel quantitative approaches to studying sources from the past such as chronicles epics folktales and myths It contributes significantly to recent efforts in bringing together natural scientists and humanities scholars in investigations aimed at achieving greater understanding of our cultural inheritance Accordingly each contribution reports on a modern quantitative approach applicable to narrative sources from the past or describes those which would be amenable to such

treatment and why they are important This volume is a unique state of the art compendium on an emerging research field which also addresses anyone with interests in quantitative approaches to humanities *Canadian Journal of Mathematics*, 1987-10 **Primary Mathematics** Penelope Baker, Rosemary Callingham, Tracey Muir, 2023-09-07 Primary Mathematics

Integrating Theory with Practice is a comprehensive introduction to teaching mathematics in Australian primary schools Closely aligned with the Australian Curriculum it provides a thorough understanding of measurement geometry patterns and algebra data and statistics and chance and probability The fourth edition provides support for educators in key aspects of teaching planning assessment digital technologies diversity in the classroom and integrating mathematics content with other learning areas It also features a new chapter on the role of education support in the mathematics classroom Each chapter has been thoroughly revised and is complemented by classroom snapshots demonstrating practical application of theories activities to further understanding and reflection questions to guide learning New in this edition are Concepts to consider which provide a guided explanation and further discussion of key concepts to support pre and in service teachers learning and teaching of the fundamentals of mathematics *International Journal of Mathematical Combinatorics, Volume 4, 2009* Linfan Mao, Topics in detail to be covered are Smarandache multi spaces with applications to other sciences such as those of algebraic multi systems multi metric spaces Smarandache geometries Differential Geometry Geometry on manifolds Combinatorial designs Combinatorial enumeration Other applications of Smarandache multi space and combinatorics

Exploring Education Policy Through Newspapers and Social Media Aspa Baroutsis, Bob Lingard, 2023-06-07 Exploring Education Policy Through Newspapers and Social Media offers an original theorised and empirically based account of contemporary re presentations re articulations and re imaginings of education policy through news and new media In its thorough exploration of the uses and effects of newspapers and Twitter in education policy the book provides a detailed research based account of media influences and opens up multiple future research agendas in media sociology and policy sociology in education The authors place an important analytical focus on mediatisation and social mediatisation or deep mediatisation and how both have effects and affects in education policy and politics Their analyses situate these sociologically within changing societies changing media and changing education policy The book also explores the effects of datafication and digitalisation of the social in all forms of media and their manifestations in morphing imbrications between the global the national and the local in education policies This book will be of great interest to researchers scholars and higher degree research students in the domains of media sociology and policy sociology of education It also will be of interest to policymakers and politicians in education teacher unions and education activists journalists and those concerned about the impacts of the decline in legacy media and the surveillance and commercialisation possibilities of new media **Success with STEM** Sue Howarth, Linda Scott, 2014-11-13 Success with STEM is an essential resource packed with advice and ideas to support and enthuse all those involved in the planning and delivery of STEM in the secondary school It offers guidance on

current issues and priority areas to help you make informed judgements about your own practice and argue for further support for your subject in school It explains current initiatives to enhance STEM teaching and offers a wide range of practical activities to support exciting teaching and learning in and beyond the classroom Illustrated with examples of successful projects in real schools this friendly inspiring book explores Innovative teaching ideas to make lessons buzz Activities for successful practical work Sourcing additional funding Finding and making the most of the best resources STEM outside the classroom Setting up and enhancing your own STEM club Getting involved in STEM competitions fairs and festivals Promoting STEM careers and tackling stereotypes Health safety and legal issues Examples of international projects An wide ranging list of project and activity titles Enriched by the authors extensive experience and work with schools Success with STEM is a rich compendium for all those who want to develop outstanding lessons and infuse a life long interest in STEM learning in their students The advice and guidance will be invaluable for all teachers subject leaders trainee teachers and NQTs

Primary Mathematics Penelope Baker, Rosemary Callingham, Tracey Muir, 2023-09-07 Primary Mathematics Integrating Theory with Practice is a comprehensive introduction to teaching mathematics in Australian primary schools Closely aligned with the Australian Curriculum it provides a thorough understanding of measurement geometry patterns and algebra data and statistics and chance and probability The fourth edition provides support for educators in key aspects of teaching planning assessment digital technologies diversity in the classroom and integrating mathematics content with other learning areas It also features a new chapter on the role of education support in the mathematics classroom Each chapter has been thoroughly revised and is complemented by classroom snapshots demonstrating practical application of theories activities to further understanding and reflection questions to guide learning New in this edition are Concepts to consider which provide a guided explanation and further discussion of key concepts to support pre and in service teachers learning and teaching of the fundamentals of mathematics

Coming Home to Math Irving P. Herman, 2020 We use numbers here there and everywhere Numbers are some of my favorite things Linking numbers operations on numbers Words and numbers being careful Writing really big and really small numbers and those in between Touching all bases at times with logs Numbers need to be exact but it ain't necessarily so The different types of numbers have not evolved but our understanding of them has Really really big and really really small numbers The whole truth of whole numbers The math of the digital world modular arithmetic or using number leftovers The math of what will be progressions of growth and decay Untangling the worlds of probability and statistics The math of what might be probability what are the odds The math of what was statistics the good the bad and the evil The math of big data The math of optimization ranking voting and allocation The math of gaming The math of risk

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follow but also prepares the human resources for the further development of the nation Among various exams CTET is the most popular teaching exam in the country Central Teaching Eligibility Test CTET is a national level test conducted by CBSE twice a year to recruit the eligible candidates as teacher The exam is conducted into 2 papers Paper 1 for class 1 5 and Paper 2 for class 6 8 Any candidate who is interested to become a teacher for classes 6 to 8 then they have to appear for both the papers The new the edition of Study Guide Success Master CTET Mathematics and Science Paper II has been prepared completely on the latest exam pattern The book has been divided into 5 key sections and further divided into chapters providing the focused study material After covering theoretical part this book also concentrates on the practice part it provides Previous Years Solved Paper 2 practice sets and more than 3000 MCQs for thorough practice Ample numbers of questions have been given which are covered in a Chapterwise manner that allows candidates to understand the trend of the questions as well as the exam This book will prove to be highly useful for the CTET Paper 2 exam as it will help in achieving the good rank in the exam

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Mike Bedford (editor), David Gibson (technical editor), 2012 [Mathematical Modelling of Zombies](#) Robert Smith?, 2014-10-14 No detailed description available for Mathematical Modelling of Zombies *Mathematics Today*, 2004

The Markets for News Helle Sjøvaag, 2022-11-17 In the face of ongoing digitisation The Markets for News examines how certain established economic features of the news industry have persisted and what makes them such stable frameworks for journalistic organisations Drawing on an analysis of Scandinavian news industries this text revises journalism s economic foundations in the context of the algorithmically driven platform economy Exploration of features such as journalism s two sided market model the network effect of platforms and chain ownership leads to a discussion about how journalism faces disruption from the introduction of artificial intelligence in the production dissemination and sale of news As journalism undergoes transformations due to revenue losses this book recognises a return to certain enduring features of journalism s organisational form in particular the chain ownership form that enables scale in adapting to platform logics and economics This text serves as a basis for a theoretical discussion about strategic media management and critical political economy in the age of digital disruption This is an insightful book for academics and researchers in the fields of journalism media industries media policy and communication studies

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Government School Prepared as per National Curriculum Framework here s representing the updated edition of Success Master CTET Mathematics Science Paper II Class VI VIII that serves as a study guide for the candidates who are willing to appear for the exam this year The book provides focused study material dividing the entire syllabus into 5 majors providing the complete coverage With more than 3000 MCQs are provided for the quick revision of the concepts Chapterwise coverage of the previous Years questions along with the Trend Analysis help aspirants for better preparation Lastly Solved Paper 2021 2 Practice Sets are given leaving no stones untouched Preparation done from this book proves to be highly useful for CTET Paper 1 in achieving good rank in the exam TOC Solved Paper 2021 January Solved Paper 2019 December Solved Paper 2019 July Solved Paper 2018 December Solved Paper 2016 September Child Development and Pedagogy English Language and Pedagogy Hindi Bhasha evm Shiksha shastra Mathematics and Pedagogy Science and Pedagogy Practice Sets 1 2 *Gas Journal* ,1926 **Handbook Of Mathematical Science Communication** Anna Maria Hartkopf,Erin Henning,2022-12-28 Mathematical science communication as well as the field of science communication in general has gained momentum over the last few decades Mathematical science communication aims to inform the public about contemporary research enhance factual and methodological knowledge and foster a greater interest and support for the science of mathematics This enables the public to apply it to their practical life and to decision making on a greater scale These objectives are met in the various formats and media through which mathematical science communication is brought to the public The first 13 chapters of the book consist of best practice examples from the areas of informal math education museums and exhibitions and the arts The final 5 chapters discuss the structural aspects of mathematical science communication and contribute to the basis for its theoretical framework

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