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From Here to Infinity 1996 a retitled and revised edition of ian stewart s the problem of mathematics this is the perfect guide to today s mathematics read about the latest discoveries including andrew wile s amazing proof of fermat s last theorem the newest advances in knot theory the four colour theorem chaos theory and fake four dimensial spaces see how simple concepts from probability theory shed light on the national lottery and tell you how to maximize your winnings discover howinfinitesimals become respectable why there are different kinds of infinity and how to square the circle with the mathematical equivalent of a pair of scissors

What's the Use? 2021-08-17 see the world in a completely new way as an esteemed mathematician shows how math powers the world from technology to health care and beyond almost all of us have sat in a math class wondering when we d ever need to know how to find the roots of a polynomial or graph imaginary numbers and in one sense we were right if we needed to we d use a computer but as ian stewart argues in what s the use math isn t just about boring computations rather it offers us new and profound insights into our world allowing us to accomplish feats as significant as space exploration and organ donation from the trigonometry that keeps a satellite in orbit to the prime numbers used by the world s most advanced security systems to the imaginary numbers that enable augmented reality math isn t just relevant to our lives it is the very fabric of our existence

The Mathematics of Life 2011-06-07 biologists have long dismissed mathematics as being unable to meaningfully contribute to our understanding of living beings within the past ten years however mathematicians have proven that they hold the key to unlocking the mysteries of our world and ourselves in the mathematics of life ian stewart provides a fascinating overview of the vital but little recognized role mathematics has played in pulling back the curtain on the hidden complexities of the natural world and how its contribution will be even more vital in the years ahead in his characteristically clear and entertaining fashion stewart explains how mathematicians and biologists have come to work together on some of the most difficult scientific problems that the human race has ever tackled including the nature and origin of life itself

The Foundations of Mathematics 2015 the transition from school mathematics to university mathematics is seldom straightforward students are faced with a disconnect between the algorithmic and informal attitude to mathematics at school versus a new emphasis on proof based on logic and a more abstract development of general concepts based on set theory the authors have many years experience of the potential difficulties involved through teaching first year undergraduates and researching the ways in which students and mathematicians think the book explains the motivation behind

abstract foundational material based on students experiences of school mathematics and explicitly suggests ways students can make sense of formal ideas this second edition takes a significant step forward by not only making the transition from intuitive to formal methods but also by reversing the process using structure theorems to prove that formal systems have visual and symbolic interpretations that enhance mathematical thinking this is exemplified by a new chapter on the theory of groups while the first edition extended counting to infinite cardinal numbers the second also extends the real numbers rigorously to larger ordered fields this links intuitive ideas in calculus to the formal epsilon delta methods of analysis the approach here is not the conventional one of nonstandard analysis but a simpler graphically based treatment which makes the notion of an infinitesimal natural and straightforward this allows a further vision of the wider world of mathematical thinking in which formal definitions and proof lead to amazing new ways of defining proving visualising and symbolising mathematics beyond previous expectations

Professor Stewart's Cabinet of Mathematical Curiosities 2010-09-03 school maths is not the interesting part the real fun is elsewhere like a magpie ian stewart has collected the most enlightening entertaining and vexing curiosities of maths over the years now the private collection is displayed in his cabinet there are some hidden gems of logic geometry and probability like how to extract a cherry from a cocktail glass harder than you think a pop up dodecahedron the real reason why you can t divide anything by zero and some tips for making money by proving the obvious scattered among these are keys to unlocking the mysteries of fermat s last theorem the poincar conjecture chaos theory and the p np problem for which a million dollar prize is on offer there are beguiling secrets about familiar names like pythagoras or prime numbers as well as anecdotes about great mathematicians pull out the drawers of the professor s cabinet and who knows what could happen

The Great Mathematical Problems 2013-03-07 there are some mathematical problems whose significance goes beyond the ordinary like fermat s last theorem or goldbach s conjecture they are the enigmas which define mathematics the great mathematical problems explains why these problems exist why they matter what drives mathematicians to incredible lengths to solve them and where they stand in the context of mathematics and science as a whole it contains solved problems like the poincar conjecture cracked by the eccentric genius grigori perelman who refused academic honours and a million dollar prize for his work and ones which like the riemann hypothesis remain baffling after centuries stewart is the guide to this mysterious and exciting world showing how modern mathematicians constantly rise to the challenges set by their predecessors as the great mathematical problems of

the past succumb to the new techniques and ideas of the present

Symmetry: A Very Short Introduction 2013-05-30 in the 1800s mathematicians introduced a formal theory of symmetry group theory now a branch of abstract algebra this subject first arose in the theory of equations symmetry is an immensely important concept in mathematics and throughout the sciences and its applications range across the entire subject symmetry governs the structure of crystals innumerable types of pattern formation how systems change their state as parameters vary and fundamental physics is governed by symmetries in the laws of nature it is highly visual with applications that include animal markings locomotion evolutionary biology elastic buckling waves the shape of the earth and the form of galaxies in this very short introduction ian stewart demonstrates its deep implications and shows how it plays a major role in the current search to unify relativity and quantum theory about the series the very short introductions series from oxford university press contains hundreds of titles in almost every subject area these pocket sized books are the perfect way to get ahead in a new subject quickly our expert authors combine facts analysis perspective new ideas and enthusiasm to make interesting and challenging topics highly readable

Professor Stewart's Hoard of Mathematical Treasures 2010-12-09 ian stewart author of the bestselling professor stewart s cabinet of mathematical curiosities presents a new and magical mix of games puzzles paradoxes brainteasers and riddles he mingles these with forays into ancient and modern mathematical thought appallingly hilarious mathematical jokes and enquiries into the great mathematical challenges of the present and past amongst a host of arcane and astonishing facts about every kind of number from irrational or imaginary to complex or cuneiform we find out how to organise chaos how matter balances anti matter how to turn a sphere inside out without creasing it why you can t comb a hairy ball how to calculate pi by observing the stars and we get some tantalising glimpses of the maths of life and the universe mind stretching enlightening and endlessly amusing professor stewart s new entertainment will stimulate delight and enthral

Professor Stewart's Incredible Numbers 2015-04-07 renowned mathematician ian stewart uses remarkable and some unremarkable numbers to introduce readers to the beauty of mathematics at its heart mathematics is about numbers our fundamental tools for understanding the world in professor stewart s incredible numbers ian stewart offers a delightful introduction to the numbers that surround us from the common pi and 2 to the uncommon but no less consequential 1 059463 and 43 252 003 274 489 856 000 along the way stewart takes us through prime numbers cubic

equations the concept of zero the possible positions on the rubik s cube the role of numbers in human history and beyond an unfailingly genial guide stewart brings his characteristic wit and erudition to bear on these incredible numbers offering an engaging primer on the principles and power of math

Do Dice Play God? 2019-06-06 uncertainty is everywhere it lurks in every consideration of the future the weather the economy the sex of an unborn child even quantities we think that we know such as populations or the transit of the planets contain the possibility of error it s no wonder that throughout that history we have attempted to produce rigidly defined areas of uncertainty we prefer the surprise party to the surprise asteroid we began our quest to make certain an uncertain world by reading omens in livers tea leaves and the stars however over the centuries driven by curiosity competition and a desire be better gamblers pioneering mathematicians and scientists began to reduce wild uncertainties to tame distributions of probability and statistical inferences but even as unknown unknowns became known unknowns our pessimism made us believe that some problems were unsolvable and our intuition misled us worse as we realized how omnipresent and varied uncertainty is we encountered chaos quantum mechanics and the limitations of our predictive power bestselling author professor ian stewart explores the history and mathematics of uncertainty touching on gambling probability statistics financial and weather forecasts censuses medical studies chaos quantum physics and climate he makes one thing clear a reasonable probability is the only certainty

Letters to a Young Mathematician 2007-08-01 the first scientific entry in the acclaimed art of mentoring series from basic books letters to a young mathematician tells readers what ian stewart wishes he had known when he was a student and young faculty member subjects ranging from the philosophical to the practical what mathematics is and why it s worth doing the relationship between logic and proof the role of beauty in mathematical thinking the future of mathematics how to deal with the peculiarities of the mathematical community and many others are dealt with in stewart s much admired style which combines subtle easygoing humor with a talent for cutting to the heart of the matter in the tradition of g h hardy s classic a mathematician s apology this book is sure to be a perennial favorite with students at all levels as well as with other readers who are curious about the frequently incomprehensible world of mathematics

Nature's Numbers 2014-03-20 a mathematical sightseeing tour of the natural world from the author of the magical maze why do many flowers have five or eight petals but very few six or seven why do snowflakes have sixfold symmetry why do tigers have stripes but leopards have spots mathematics is to

nature as sherlock holmes is to evidence mathematics can look at a single snowflake and deduce the atomic geometry of its crystals it can start with a violin string and uncover the existence of radio waves and mathematics still has the power to open our eyes to new and unsuspected regularities the secret structure of a cloud or the hidden rhythms of the weather there are patterns in the world we are now seeing for the first time patterns at the frontier of science yet patterns so simple that anybody can see them once they know where to look

Professor Stewart's Casebook of Mathematical Mysteries 2014-10-02 like its wildly popular predecessors cabinet of mathematical curiosities and hoard of mathematical treasures professor stewart s brand new book is a miscellany of over 150 mathematical curios and conundrums packed with trademark humour and numerous illustrations in addition to the fascinating formulae and thrilling theorems familiar to professor stewart s fans the casebook follows the adventures of the not so great detective hemlock soames and his sidekick dr john watsup immortalised in the phrase watsup doc by a remarkable coincidence they live at 222b baker street just across the road from their more illustrious neighbour who for reasons known only to dr watsup is never mentioned by name a typical item is the case of the face down aces a mathematical magic trick of quite devilish cunning ranging from one liners to four page investigations from the frontiers of mathematical research the casebook reveals professor stewart at his challenging and entertaining best

Galois Theory 2015-03-06 since 1973 galois theory has been educating undergraduate students on galois groups and classical galois theory in galois theory fourth edition mathematician and popular science author ian stewart updates this well established textbook for today s algebra students new to the fourth editionthe replacement of the topological proof of the fundame

Taming the Infinite 2009-09-03 from ancient babylon to the last great unsolved problems ian stewart brings us his definitive history of mathematics in his famous straightforward style professor stewart explains each major development from the first number systems to chaos theory and considers how each affected society and changed everyday life forever maintaining a personal touch he introduces all of the outstanding mathematicians of history from the key babylonians greeks and egyptians via newton and descartes to fermat babbage and gödel and demystifies maths key concepts without recourse to complicated formulae written to provide a captivating historic narrative for the non mathematician taming the infinite the story of mathematics is packed with fascinating nuggets and quirky asides and contains 100 illustrations and diagrams to illuminate and aid understanding of a subject many dread but which has made our world what it is today

Calculating the Cosmos 2016-09-15 ian stewart s up to the minute guide to the cosmos moves from the formation of the earth and its moon to the planets and asteroids of the solar system and from there out into the galaxy and the universe he describes the architecture of space and time dark matter and dark energy how galaxies form why stars implode how everything began and how it will end he considers parallel universes what forms extra terrestrial life might take and the likelihood of earth being hit by an asteroid mathematics professor stewart shows has been the driving force in astronomy and cosmology since the ancient babylonians he describes how kepler s work on planetary orbits led newton to formulate his theory of gravity and how two centuries later irregularities in the motion of mars inspired einstein s theory of general relativity in crystal clear terms he explains the fundamentals of gravity spacetime relativity and quantum theory and shows how they all relate to each other eighty years ago the discovery that the universe is expanding led to the big bang theory of its origins this in turn led cosmologists to posit features such as dark matter and dark energy but does dark matter exist could another scientific revolution be on the way to challenge current scientific orthodoxy these are among the questions ian stewart raises in his quest through the realms of astronomy and cosmology

Math Hysteria 2004-05-13 welcome to ian stewart s strange and magical world of mathematics in math hysteria professor stewart presents us with a wealth of magical puzzles each one spun around an amazing tale counting the cattle of the sun the great drain robbery and preposterous piratical predicaments to name but a few along the way we also meet many curious characters in short these stories are engaging challenging and lots of fun

The Problems of Mathematics 1992 for the second edition of this introduction to today s mathematics ian stewart has revised the text to take account of recent developments in the field there are three new chapters including one on kepler s sphere packing problem which has taken 380 years to solve

Millenium and Great Problems in Mathematics 2014-03-06 there are some mathematical problems whose significance goes beyond the ordinary like fermat s last theorem or goldbach s conjecture they are the enigmas which define mathematics the great mathematical problems explains why these problems exist why they matter what drives mathematicians to incredible lengths to solve them and where they stand in the context of mathematics and science as a whole it contains solved problems like the poincaré conjecture cracked by the eccentric genius grigori perelman who refused academic honours and a million dollar prize for his work and ones which like the riemann hypothesis remain baffling after centuries stewart is the guide to this mysterious and exciting world showing how modern mathematicians constantly rise to the challenges set by their predecessors as the great

mathematical problems of the past succumb to the new techniques and ideas of the present if you loved professor dt

Significant Figures 2017-09-12 a celebrated mathematician traces the history of math through the lives and work of twenty five pioneering mathematicians in significant figures acclaimed mathematician ian stewart explores the work of 25 of history s most important mathematicians showing how they developed on each other s work and built the mathematics we use today through these short biographies we get acquainted with the history of mathematics from archimedes to william thurston and learn about those too often left out of the cannon such as muhammad ibn musa al khwarizmi the creator of algebra ada lovelace the world s first computer programmer and emmy noether whose research on symmetry paved the way for modern physics tracing the evolution of mathematics over the course of two millennia significant figures will educate and delight aspiring mathematicians and experts alike

Another Fine Math You've Got Me Into. . . 2013-02-20 sixteen columns from the french edition of scientific american feature oddball characters and wacky wordplay in a mathematical wonderland of puzzles and games that also imparts significant mathematical ideas 1992 edition

<u>What S the Use (air/exp)</u> 2021-08-19 a bestselling author tries to rehabillitate a much maligned field

In Pursuit of the Unknown 2012-03-13 the seventeen equations that form the basis for life as we know it most people are familiar with history s great equations newton s law of gravity for instance or einstein s theory of relativity but the way these mathematical breakthroughs have contributed to human progress is seldom appreciated in in pursuit of the unknown celebrated mathematician ian stewart untangles the roots of our most important mathematical statements to show that equations have long been a driving force behind nearly every aspect of our lives using seventeen of our most crucial equations including the wave equation that allowed engineers to measure a building s response to earthquakes saving countless lives and the black scholes model used by bankers to track the price of financial derivatives over time stewart illustrates that many of the advances we now take for granted were made possible by mathematical discoveries an approachable lively and informative guide to the mathematical building blocks of modern life in pursuit of the unknown is a penetrating exploration of how we have also used equations to make sense of and in turn influence our world

Concepts of Modern Mathematics 2012-05-23 in this charming volume a noted english mathematician uses humor and anecdote to illuminate the concepts of groups sets subsets topology boolean algebra and other mathematical subjects 200 illustrations

Galois Theory 2022-09-07 since 1973 galois theory has been educating undergraduate students on galois groups and classical galois theory in galois theory fifth edition mathematician and popular science author ian stewart updates this well established textbook for today s algebra students new to the fifth edition reorganised and revised chapters 7 and 13 new exercises and examples expanded updated references further historical material on figures besides galois omar khayyam vandermonde ruffini and abel a new final chapter discussing other directions in which galois theory has developed the inverse galois problem differential galois theory and a very brief introduction to p adic galois representations this bestseller continues to deliver a rigorous yet engaging treatment of the subject while keeping pace with current educational requirements more than 200 exercises and a wealth of historical notes augment the proofs formulas and theorems

Why Beauty Is Truth 2007-08-02 at the heart of relativity theory quantum mechanics string theory and much of modern cosmology lies one concept symmetry in why beauty is truth world famous mathematician ian stewart narrates the history of the emergence of this remarkable area of study stewart introduces us to such characters as the renaissance italian genius rogue scholar and gambler girolamo cardano who stole the modern method of solving cubic equations and published it in the first important book on algebra and the young revolutionary evariste galois who refashioned the whole of mathematics and founded the field of group theory only to die in a pointless duel over a woman before his work was published stewart also explores the strange numerology of real mathematics in which particular numbers have unique and unpredictable properties related to symmetry he shows how wilhelm killing discovered lie groups with 14 52 78 133 and 248 dimensions groups whose very existence is a profound puzzle finally stewart describes the world beyond superstrings the octonionic symmetries that may explain the very existence of the universe

Professor Stewart's Cabinet of Mathematical Curiosities 2019 from lyrical descriptions of the first pulses of life on the shores of the primordial oceans to rhapsodic contemplations of the beautiful intimacy of butterfly wings and the artful ripples of angel fish scales life s other secret offers a new vision of the beauty and elegance of the natural world and a revolutionary perspective on the forces that govern the life around us 80 illustrations 20 photos

Life's Other Secret 1998-01-05 this visually stunning volume takes the reader on an illustrated tour of mathematics across cultures and civilizations bringing to life a world of important ideas and rarely supposed great intrigue and charm

The Story of Mathematics 2008 enter the magical maze of mathematics and explore the surprising passageways of a fantastical world where logic and

imagination converge for mathematics is a maze a maze in your head a maze of ideas a maze of logic and that maze in your mind is a powerful tool for understanding an even bigger maze the one of cause and effect that we call the universe that is its special kind of magic real magic strange magic infinitely fascinating magic acclaimed author ian stewart leads you swiftly and humorously through the junctions byways and secret passages of the magical maze to reveal its beauty surprise and power along the way he reveals the infinite possibilities that arise from what he calls the two way trade between the natural world and the human mind if you ve always loved mathematics you will find endless delights in the twists and turns of the magical maze if you ve always hated mathematics a trip through this marvelous book will do much to change your mind

The Magical Maze 1998-03-11 twelve essays take a playful approach to mathematics investigating the topology of a blanket the odds of beating a superior tennis player and how to distinguish between fact and fallacy

Game, Set and Math 2013-02-04 in cows in the maze ian stewart returns with another selection of puzzles to amaze and delight we encounter a diverse range of mathematical investigations and discoveries fromt he mathematical patterns of animal movement walking with quadrupeds and time travel forward to the future to intriguing facts aobut familiar objects the lore and lure of dice and of course the problem of how to find a cow in a maze

Cows in the Maze 2010-04-22 from a zebra s stripes to a spider s web an engaging examination of patterns in nature and the mathematics that underlie them from a zebra s stripes to a spider s web from sand dunes to snowflakes nature is full of patterns underlaid by mathematical principles in the beauty of numbers in nature ian stewart shows how life forms from the principles of mathematics each chapter in the beauty of numbers in nature explores a different kind of patterning system and its mathematical underpinnings in doing do the book also uncovers some universal patterns both in nature and made by humans from the basic geometry of ancient greece to the complexities of fractals stewart draws on a wide range of sources to examine the mathematics of patterns the pythagoreans obsession with numbers as the philosophical basis of the universe a great mathematician who wondered about how a violin makes music a clerk in a patent office who realized that space and time can get mixed together a maverick mathematician who questioned why nature spurns such regular geometric shapes as spheres and cylinders in favor of jagged lightning bolts asymmetrically branching trees and the uneven terrain of mountainsides the book begins with a simple and often asked question about the shape and individual uniqueness of snowflakes how can such a strange mixture of regularity and irregularity exist in a tiny bit of frozen water by the end of the book readers will have

learned that mathematical patterns can come in many guises some of which don t resemble patterns at all

The Beauty of Numbers in Nature 2017-09-08 since the dramatic discovery of the mathematical concept of chaos in 1989 the controversy of its contents has settled down this revised edition of does god play dice takes a fresh look at its achievements and potential with a new preface and three completely new chapters it includes the latest practical applications of chaos theory such as developing intelligent heart pacemakers all this provides a fascinating new answer to einstien s question which provided the title of this book

Does God Play Dice? 1997-06-26 welcome back to ian stewart s magical world of mathematics this is a strange world of never ending chess games empires on the moon furious fireflies and of course disputes over how best to cut a cake each quirky tale presents a fascinating mathematical puzzle challenging fun and also introducing the reader to a significant mathematical problem in an engaging and witty way

How to Cut a Cake 2006-10-12 infinity is an intriguing topic with connections to religion philosophy metaphysics logic and physics as well as mathematics its history goes back to ancient times with especially important contributions from euclid aristotle eudoxus and archimedes the infinitely large infinite is intimately related to the infinitely small infinitesimal cosmologists consider sweeping questions about whether space and time are infinite philosophers and mathematicians ranging from zeno to russell have posed numerous paradoxes about infinity and infinitesimals many vital areas of mathematics rest upon some version of infinity the most obvious and the first context in which major new techniques depended on formulating infinite processes is calculus but there are many others for example fourier analysis and fractals in this very short introduction ian stewart discusses infinity in mathematics while also drawing in the various other aspects of infinity and explaining some of the major problems and insights arising from this concept he argues that working with infinity is not just an abstract intellectual exercise but that it is instead a concept with important practical everyday applications and considers how mathematicians use infinity and infinitesimals to answer questions or supply techniques that do not appear to involve the infinite about the series the very short introductions series from oxford university press contains hundreds of titles in almost every subject area these pocket sized books are the perfect way to get ahead in a new subject quickly our expert authors combine facts analysis perspective new ideas and enthusiasm to make interesting and challenging topics highly readable

Infinity: A Very Short Introduction 2017-03-13 first there was edwin a abbott s remarkable flatland published in 1884 and one of the all time classics of

popular mathematics now from mathematician and accomplished science writer ian stewart comes what nature calls a superb sequel through larger than life characters and an inspired story line flatterland explores our present understanding of the shape and origins of the universe the nature of space time and matter as well as modern geometries and their applications the journey begins when our heroine victoria line comes upon her great great grandfather a square s diary hidden in the attic the writings help her to contact the space hopper who tempts her away from her home and family in flatland and becomes her guide and mentor through ten dimensions in the tradition of alice in wonderland and the phantom toll booth this magnificent investigation into the nature of reality is destined to become a modern classic

Flatterland 2008-08-01 the teaching and learning of mathematics has degenerated into the realm of rote memorization the outcome of which leads to satisfactory formal ability but not real understanding or greater intellectual independence the new edition of this classic work seeks to address this problem its goal is to put the meaning back into mathematics lucid easily understandable albert einstein 301 linecuts

𝑚𝑎𝑡ℎ𝑒𝑚𝑎𝑡𝑖𝑐𝑠 1981 an enlightening vision of how the laws of mathematics find organic expression in the beauty and patterns of nature written by an acclaimed mathematician and science writer

What is Mathematics? 1996

What Shape is a Snowflake? 2001

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