

**GRADE 12 MATHEMATICS
NOVEMBER EXAMINATION PAPER 1**

QUESTION 1

1.1 Solve for x

1.1.1 $x^2 - 9x + 20 = 0$ (3)

1.1.2 $x(x + 3) - 1 = 0$ (correct to 2 decimal points) (3)

1.1.3 $x^2 + 7x < 0$ (3)

1.1.4 $2x^{\frac{2}{3}} = 64$ (4)

1.2 Solve simultaneously for x and y if:

$2x - y = 8$, and
 $x^2 - xy + y^2 = 19$ (7)

1.3 Solve the expression below without the use of a calculator:

$$\frac{\sqrt[3]{4} + \sqrt[3]{16}}{\sqrt[3]{16}}$$

(4)

QUESTION 2

2.1 The terms p , $(2p + 2)$, $(5p + 3)$ form an arithmetic sequence.

Determine:

2.1.1 The value of p . (4)

2.1.2 The rule in the form of $a_n = a + (n - 1)d$. (2)

2.1.3 The 15th term of the sequence. (4)

2.2 x , y , 81 is a geometric sequence.
And $y = 2x - 5$
All terms in the sequences are integers.
Calculate the values of x and y . (10)

(20)

QUESTION 3

Given the sequence 2, 8, 10, 14,

3.1 What type of sequence is this? Justify your answer by calculation. (2)

3.2 Calculate T_{10} . (3)

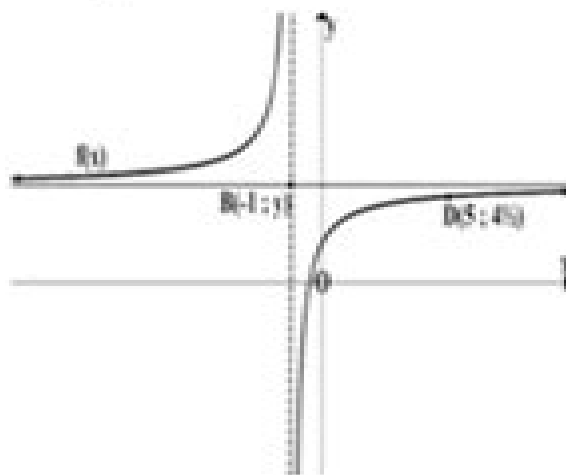
3.3 Which term has a value of 322? (3)

3.4 Determine by calculation if 1204 is a term in the sequence? (4)

(12)

QUESTION 4

The sketch below shows the graph of $f(x) = \frac{-1}{x+5} + 4$. The asymptotes of f intersects at $B(-1; y)$. The Point $D(5; 4)$ is a point on the graph.



4.1 Determine the value of p . (1)

4.2 Prove that $q = 5$. (2)

4.3 Calculate the x -intercept of f . (2)

4.4 Determine the equation of the vertical asymptote of h if $h(x) = f(x + 4)$. (2)

4.5 One of the symmetry axes of f is an increasing function. Determine the equation of the symmetry axis. (3)

4.6 Give the values x for $f(x) \geq x + 6$. (2)

4.7 Determine the equation of g , the reflection of f in the x -axis and move two units to the right. (3)

(15)

Mathematics Memo Paper November 2013

**Safaa El Tayeb El-Kogali, Caroline
Krafft**



Mathematics Memo Paper November 2013:

Collected Papers. Volume X Florentin Smarandache, 2022-06-01 This tenth volume of Collected Papers includes 86 papers in English and Spanish languages comprising 972 pages written between 2014 2022 by the author alone or in collaboration with the following 105 co authors alphabetically ordered from 26 countries Abu Su an Ali Hassan Ali Safaa Sadiq Anirudha Ghosh Assia Bakali Atiqe Ur Rahman Laura Bogdan Willem K M Brauers Erick Gonz lez Caballero Fausto Cavallaro Gavril Calefariu T Chalapathi Victor Christianto Mihaela Colhon Sergiu Boris Cononovici Mamoni Dhar Irfan Deli Rebeca Escobar Jara Alexandru Gal N Gandotra Sudipta Gayen Vassilis C Gerogiannis Noel Batista Hern ndez Hongnian Yu Hongbo Wang Mihaela Iliescu F Nirmala Irudayam Sripati Jha Darjan Karaba evi T Katican Bakhtawar Ali Khan Hina Khan Volodymyr Krasnoholovets R Kiran Kumar Manoranjan Kumar Singh Ranjan Kumar M Lathamaheswari Yasar Mahmood Nivetha Martin Adrian M rgean Octavian Melinte Mingcong Deng Marcel Migdalovici Monika Moga Sana Moin Mohamed Abdel Basset Mohamed Elhoseny Rehab Mohamed Mohamed Talea Kalyan Mondal Muhammad Aslam Muhammad Aslam Malik Muhammad Ihsan Muhammad Naveed Jafar Muhammad Rayees Ahmad Muhammad Saeed Muhammad Saqlain Muhammad Shabir Mujahid Abbas Mumtaz Ali Radu I Munteanu Ghulam Murtaza Munazza Naz Tahsin Oner Gabrijela Popovi Surapati Pramanik R Priya S P Priyadharshini Midha Qayyum Quang Thinh Bui Shazia Rana Akbara Rezaei Jes s Estupi n Ricardo R dvan Sahin Saeeda Mirvakili Said Broumi A A Salama Flavius Aurelian S rbu Ganeshsree Selvachandran Javid Shabbir Shio Gai Quek Son Hoang Le Florentin Smarandache Dragi a Stanujki S Sudha Taha Yasin Ozturk Zaigham Tahir The Houw Iong Ayse Topal Alptekin Uluta Maikel Yelandi Leyva V zquez Rizha Vitania Luige Vl d reanu Victor Vl d reanu tefan Vl du escu J Vimala Dan Valeriu Voinea Adem Yolcu Yongfei Feng Abd El Nasser H Zaied Edmundas Kazimieras Zavadskas

Collected Papers. Volume XIV Florentin Smarandache, 2022-11-01 This fourteenth volume of Collected Papers is an eclectic tome of 87 papers in Neutrosophics and other fields such as mathematics fuzzy sets intuitionistic fuzzy sets picture fuzzy sets information fusion robotics statistics or extenics comprising 936 pages published between 2008 2022 in different scientific journals or currently in press by the author alone or in collaboration with the following 99 co authors alphabetically ordered from 26 countries Ahmed B Al Nafee Adesina Abdul Akeem Agboola Akbar Rezaei Shariful Alam Marina Alonso Fran Andujar Toshinori Asai Assia Bakali Azmat Hussain Daniela Baran Bijan Davvaz Bilal Hadjadji Carlos D az Bohorquez Robert N Boyd M Caldas Cenap zel Pankaj Chauhan Victor Christianto Salvador Coll Shyamal Dalapati Irfan Deli Balasubramanian Elavarasan Fahad Alsharari Yonfei Feng Daniela G fu Rafael Rojas Gualdr n Haipeng Wang Hemant Kumar Gianey Noel Batista Hern ndez Abdel Nasser Hussein Ibrahim M Hezam Ilanthenral Kandasamy W B Vasantha Kandasamy Muthusamy Karthika Nour Eldeen M Khalifa Madad Khan Kifayat Ullah Valeri Kroumov Tapan Kumar Roy Deepesh Kunwar Le Thi Nhung Pedro L pez Mai Mohamed Manh Van Vu Miguel A Quiroz Mart nez Marcel Migdalovici Kritika Mishra Mohamed Abdel Basset Mohamed Talea Mohammad Hamidi Mohammed Alshumrani Mohamed Loey

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Neutrosophic Sets and Systems, Vol. III Florentin Smarandache, Mumtaz Ali, This volume is a collection of ten papers written by different authors and co authors listed in the order of the papers F Yuhua A A Salama F Smarandache S A Alblowi M Ali M Shabir M Naz A A A Agboola S A Akinleye M Dhar S Broumi P Biswas S Pramanik B C Giri H A El Ghareeb A M Maine V Kandasamy P Sekar and J Vidhyalakshmi In first paper the author proposed Expanding Newton Mechanics with

Neutrosophy and Quad stage Method New Newton Mechanics Taking Law of Conservation of Energy as Unique Source Law The Characteristic Function of a Neutrosophic Set is proposed in the second paper Neutrosophic Left Almost Semigroup is studied in third paper In fourth paper Neutrosophic Hypercompositional Structures defined by Binary Relations are introduced Similarly in fifth paper A Note on Square Neutrosophic Fuzzy Matrices are discussed In paper six A New Methodology for Neutrosophic Multi Attribute Decision Making with Unknown Weight Information is presented by the authors Introduction to Develop Some Software Programs for dealing with Neutrosophic Sets is given in seventh paper Paper eight is about to Soft Neutrosophic Ring and Soft Neutrosophic Field In the next paper Rough Neutrosophic Sets are discussed The authors introduced new type of Fuzzy Relational Equations and Neutrosophic Relational Equations To Analyze Customer Preference to street shops in the last paper

GED® Math Test Tutor, For the New 2014 GED® Test Sandra Rush, 2013-09-20 REA's GED Math Test Tutor Helps You Pass the Most Challenging Part of the GED Get ready for the math portion of the GED with REA's GED Math Test Tutor Book features Content 100% aligned with the new 2014 GED test Written by a GED math tutor and test expert Comprehensive review covers every topic on the exam Includes step by step instructions on how to use the TI 30XS MultiView calculator 2 full length practice tests featuring new question types with detailed answers It's like having your own tutor Every year test takers report that the math test is the toughest of all the GED tests That's why REA offers the most complete guide to success on the new GED Math test Let our expert math tutor help you get one step closer to your GED diploma GED test tutor Sandra Rush gives you all the tools you need to succeed Refresh your knowledge on all things math from polynomials and powers to statistics and equations fractions decimals and scientific notation Know your way around the TI 30XS MultiView calculator a step by step tutorial gets you up and running in no time Helpful hints you need to know hundreds of hints shortcuts and exercises reinforce key math points including secrets of rounding calculating with fractions quickly knowing the difference between domain and range a neat way to remember negative and absolute values and much more 2 full length practice tests mimic the real GED Math test Preview all the new question types including hot spot fill in the blank drag and drop and more Detailed answer explanations help you build your knowledge and identify where you need more review and practice If you're concerned about your math score on the GED you need REA's GED Math Test Tutor

Neutrosophic Sets and Systems, Vol. V Florentin Smarandache, Mumtaz Ali, This book is a collection of nine papers contributed by different authors and co authors listed in the order of the papers A A Salama O M Khaled K M Mahfouz M Ali F Smarandache M Shabir L Vladareanu S Broumi K Mondal S Pramanik I Arockiarani I R Sumathi M Eisa and I Deli In first paper the authors studied Neutrosophic Correlation and Simple Linear Regression The Generalization of Neutrosophic Rings and Neutrosophic Fields is proposed in the second paper Cosine Similarity Measure of Interval Valued Neutrosophic Sets is studied in third paper In fourth paper A Study on Problems of Hijras in West Bengal Based on Neutrosophic Cognitive Maps is introduced Similarly in fifth paper Neutrosophic Crisp Set Theory is discussed In

paper six Interval Valued Fuzzy Neutrosophic Soft Structure Spaces are presented by the authors Soft Neutrosophic Bi LA Semigroup and Soft Neutrosophic N LA Semigroup is given in seventh paper Introduction to Image Processing via Neutrosophic Technique is given in paper eight In the last paper Neutrosophic Soft Multi Set Theory and Its Decision Making is presented by the authors

Topics in Domination in Graphs Teresa W. Haynes, Stephen T. Hedetniemi, Michael A. Henning, 2020-10-19 This volume comprises 16 contributions that present advanced topics in graph domination featuring open problems modern techniques and recent results The focus is on primary dominating sets such as paired domination connected domination restrained domination dominating functions Roman domination and power domination Additionally surveys include known results with a sample of proof techniques for each parameter Of extra benefit to the reader the first chapter includes a glossary of commonly used terms the second chapter provides an overview of models of domination from which the parameters are defined The book is intended to provide a reference for established researchers in the fields of domination and graph theory and graduate students who wish to gain knowledge of the topics covered as well as an overview of the major accomplishments in the field and proof techniques used

Neutrosophic Sets and Systems, vol. 5/2014 A. A. Salama, O. M. Khaled, K. M. Mahfouz, S. Broumi, F. Smarandache, K. Mondal, S. Praminik, M. Eisa, M. Ali, Neutrosophic Sets and Systems has been created for publications on advanced studies in neutrosophy neutrosophic set neutrosophic logic neutrosophic probability neutrosophic statistics that started in 1995 and their applications in any field such as the neutrosophic structures developed in algebra geometry topology etc

Graph-Theoretic Concepts in Computer Science Michael A. Bekos, Michael Kaufmann, 2022-09-30 This LNCS 13453 constitutes the thoroughly refereed proceedings of the 48th International Workshop on Graph Theoretic Concepts in Computer Science WG 2022 The 32 full papers presented in this volume were carefully reviewed and selected from a total of 96 submissions The WG 2022 workshop aims to merge theory and practice by demonstrating how concepts from Graph Theory can be applied to various areas in Computer Science or by extracting new graph theoretic problems from applications

Reframing Economics Roger A McCain, 2014-03-28 The objectives of this book are twofold Firstly it proposes that economics should be defined as a study of imperfect cooperation Secondly it elucidates the continuities that extend from classical political economy through the neoclassical Keynesia

Formality of the Little \mathbb{N} -disks Operad Pascal Lambrechts, Ismar Volić, 2014-06-05 The little disks operad along with its variants is an important tool in homotopy theory It is defined in terms of configurations of disjoint dimensional disks inside the standard unit disk in \mathbb{R}^n and it was initially conceived for detecting and understanding fold loop spaces Its many uses now stretch across a variety of disciplines including topology algebra and mathematical physics In this paper the authors develop the details of Kontsevich's proof of the formality of little disks operad over the field of real numbers More precisely one can consider the singular chains on as well as the singular homology of These two objects are operads in the category of chain complexes The formality then states that there is a zig zag of quasi isomorphisms connecting these two

operads The formality also in some sense holds in the category of commutative differential graded algebras The authors additionally prove a relative version of the formality for the inclusion of the little disks operad in the little disks operad when

Algebra and Its Applications Mohammad Ashraf,Vincenzo De Filippis,Syed Tariq Rizvi,2018-08-06 This volume showcases mostly the contributions presented at the International Conference in Algebra and Its Applications held at the Aligarh Muslim University Aligarh India during November 12 14 2016 Refereed by renowned experts in the field this wide ranging collection of works presents the state of the art in the field of algebra and its applications covering topics such as derivations in rings category theory Baer module theory coding theory graph theory semi group theory HNP rings Leavitt path algebras generalized matrix algebras Nakayama conjecture near ring theory and lattice theory All of the contributing authors are leading international academicians and researchers in their respective fields Contents On Structure of Prime Rings with Generalized Derivation A characterization of additive mappings in rings with involution Skew constacyclic codes over F_q vF_q v_2F_q Generalized total graphs of commutative rings A survey Differential conditions for which near rings are commutative rings Generalized Skew Derivations satisfying the second Posner's theorem on Lie ideals Generalized Skew Derivations on Lie Ideals in Prime Rings On generalized derivations and commutativity of prime rings with involution On n d Krull property in amalgamated algebra Pure ideals in ordered semigroups Projective ideals of differential polynomial rings over HNP rings Additive central m power skew commuting maps on semiprime rings A Note on CESS Lattices Properties Inherited by Direct Sums of Copies of a Module Modules witnessing that a Leavitt path algebra is directly infinite Inductive Groupoids and Normal Categories of Regular Semigroups Actions of generalized derivations in Rings and Banach Algebras Proper Categories and Their Duals On Nakayama Conjecture and related conjectures Review On construction of global actions for partial actions On 2 absorbing and Weakly 2 absorbing Ideals in Product Lattices Separability in algebra and category theory Annihilators of power values of generalized skew derivations on Lie ideals Generalized derivations on prime rings with involution

The Math Teacher's Toolbox Bobson Wong,Larisa Bukalov,2020-04-09 Math teachers will find the classroom tested lessons and strategies in this book to be accessible and easily implemented in the classroom The Teacher's Toolbox series is an innovative research based resource providing teachers with instructional strategies for students of all levels and abilities Each book in the collection focuses on a specific content area Clear concise guidance enables teachers to quickly integrate low prep high value lessons and strategies in their middle school and high school classrooms Every strategy follows a practical how to format established by the series editors The Math Teacher's Toolbox contains hundreds of student friendly classroom lessons and teaching strategies Clear and concise chapters fully aligned to Common Core math standards cover the underlying research required technology practical classroom use and modification of each high value lesson and strategy This book employs a hands on approach to help educators quickly learn and apply proven methods and techniques in their mathematics courses Topics range from the planning of units lessons tests and homework to conducting formative

assessments differentiating instruction motivating students dealing with math anxiety and culturally responsive teaching
Easy to read content shows how and why math should be taught as a language and how to make connections across mathematical units Designed to reduce instructor preparation time and increase student engagement and comprehension
this book Explains the usefulness application and potential drawbacks of each instructional strategy Provides fresh activities for all classrooms Helps math teachers work with ELLs advanced students and students with learning differences Offers real world guidance for working with parents guardians and co teachers The Math Teacher s Toolbox Hundreds of Practical ideas to Support Your Students is an invaluable source of real world lessons strategies and techniques for general education teachers and math specialists as well as resource specialists special education teachers elementary and secondary educators and teacher educators

Policy Making in Britain Peter Dorey,2014-04-22 Introducing you to the public policy making process in Britain today this book adopts an empirical approach to the study of policy making by relating theory to actual developments in Britain since the 1980s It covers Ideas Problem Definition Issues and Agenda Setting Key Individuals Key Institutions Parliament and Public Policy Implementation The shift from Government to Governance including marketization and devolution The increasing role of the private and voluntary sectors in policy delivery Internationalisation and Europeanization of policies and policy making Evaluation audits and the New Public Management Each chapter is enriched by recent real life case studies and boxes illustrating key arguments concepts and empirical developments Taking into account the 2010 election and beyond the book addresses current issues developments and debates The result is a contemporary and engaging text that will be required reading for all students of British politics public policy and public administration

Disorder and the Disinformation Society Jonathan Paul Marshall,James Goodman,Didar Zowghi,Francesca da Rimini,2015-04-17 This book is the first general social analysis that seriously considers the daily experience of information disruption and software failure within contemporary Western society Through an investigation of informationalism defined as a contemporary form of capitalism it describes the social processes producing informational disorder While most social theory sees disorder as secondary pathological or uninteresting this book takes disordering processes as central to social life The book engages with theories of information society which privilege information order offering a strong counterpoint centred on disinformation Disorder and the Disinformation Society offers a practical agenda arguing that difficulties in producing software are both inherent to the process of developing software and in the social dynamics of informationalism It outlines the dynamics of software failure as they impinge on of information workers and on daily life explores why computerized finance has become inherently self disruptive asks how digital enclosure and intellectual property create conflicts over cultural creativity and disrupt informational accuracy and scholarship and reveals how social media can extend but also distort the development of social movements

7th International Conference on University Learning and Teaching (InCULT 2014) Proceedings Chan Yuen Fook,Gurnam Kaur Sidhu,Suthagar Narasuman,Lee Lai

Fong, Shireena Basree Abdul Rahman, 2015-12-30 The book comprises papers presented at the 7th International Conference on University Learning and Teaching InCULT 2014 which was hosted by the Asian Centre for Research on University Learning and Teaching ACRULeT located at the Faculty of Education Universiti Teknologi MARA Shah Alam Malaysia It was co hosted by the University of Hertfordshire UK the University of South Australia the University of Ohio USA Taylor s University Malaysia and the Training Academy for Higher Education AKEPT Ministry of Education Malaysia A total of 165 papers were presented by speakers from around the world based on the theme Educate to Innovate in the 21st Century The papers in this timely book cover the latest developments issues and concerns in the field of teaching and learning and provide a valuable reference resource on university teaching and learning for lecturers educators researchers and policy makers

99 Variations on a Proof Philip Ording, 2021-10-19 An exploration of mathematical style through 99 different proofs of the same theorem This book offers a multifaceted perspective on mathematics by demonstrating 99 different proofs of the same theorem Each chapter solves an otherwise unremarkable equation in distinct historical formal and imaginative styles that range from Medieval Topological and Doggerel to Chromatic Electrostatic and Psychedelic With a rare blend of humor and scholarly aplomb Philip Ording weaves these variations into an accessible and wide ranging narrative on the nature and practice of mathematics Inspired by the experiments of the Paris based writing group known as the Oulipo whose members included Raymond Queneau Italo Calvino and Marcel Duchamp Ording explores new ways to examine the aesthetic possibilities of mathematical activity 99 Variations on a Proof is a mathematical take on Queneau s Exercises in Style a collection of 99 retellings of the same story and it draws unexpected connections to everything from mysticism and technology to architecture and sign language Through diagrams found material and other imagery Ording illustrates the flexibility and creative potential of mathematics despite its reputation for precision and rigor Readers will gain not only a bird s eye view of the discipline and its major branches but also new insights into its historical philosophical and cultural nuances Readers no matter their level of expertise will discover in these proofs and accompanying commentary surprising new aspects of the mathematical landscape

Engineering Optimization R. Russell Rhinehart, 2018-05-29 An Application Oriented Introduction to Essential Optimization Concepts and Best Practices Optimization is an inherent human tendency that gained new life after the advent of calculus now as the world grows increasingly reliant on complex systems optimization has become both more important and more challenging than ever before Engineering Optimization provides a practically focused introduction to modern engineering optimization best practices covering fundamental analytical and numerical techniques throughout each stage of the optimization process Although essential algorithms are explained in detail the focus lies more in the human function how to create an appropriate objective function choose decision variables identify and incorporate constraints define convergence and other critical issues that define the success or failure of an optimization project Examples exercises and homework throughout reinforce the author s do not study approach to learning underscoring

the application oriented discussion that provides a deep generic understanding of the optimization process that can be applied to any field Providing excellent reference for students or professionals Engineering Optimization Describes and develops a variety of algorithms including gradient based such as Newton s and Levenberg Marquardt direct search such as Hooke Jeeves Leapfrogging and Particle Swarm along with surrogate functions for surface characterization Provides guidance on optimizer choice by application and explains how to determine appropriate optimizer parameter values Details current best practices for critical stages of specifying an optimization procedure including decision variables defining constraints and relationship modeling Provides access to software and Visual Basic macros for Excel on the companion website along with solutions to examples presented in the book Clear explanations explicit equation derivations and practical examples make this book ideal for use as part of a class or self study assuming a basic understanding of statistics calculus computer programming and engineering models Anyone seeking best practices for making the best choices will find value in this introductory resource

Expectations and Aspirations Safaa El Tayeb El-Kogali,Caroline Krafft,2019-01-30

Education which has been at the heart of the Middle East and North Africa MENA region s history and civilizations for centuries has a large untapped potential to contribute to human capital well being and wealth The region has invested heavily in education for decades but it has not been able to reap the benefits of its investments Despite a series of reforms MENA has remained stuck in a low learning low skills level Expectations and Aspirations A New Framework for Education in the Middle East and North Africa identifies four key sets of tensions that are holding back education in the region credentials and skills discipline and inquiry control and autonomy and tradition and modernity These tensions are shaped by society and are reflected in classrooms If they are not addressed MENA will continue to operate at a level below its potential This report outlines a new framework with a three pronged approach that can help address these tensions and unleash the potential of education in MENA A concerted push for learning that starts early for all children regardless of background with qualified and motivated educators and that leverages technology uses modern approaches and monitors learning outcomes A stronger pull for skills by all stakeholders in the labor market and society that involves coordinated multisystem reforms within and beyond the education system A new pact for education at the national level with a unified vision shared responsibilities and accountabilities Education is not just the responsibility of the education system it is everyone s business The push pull and pact framework offers an opportunity for MENA to move forward to reclaim its heritage of a learned region and to meet the expectations and aspirations of its people The current situation in MENA requires a renewed focus on education not just as a national priority for economic growth and social development but as a national emergency for stability peace and prosperity

The Rules of Contagion Adam Kucharski,2020-07-07 One of the Best Books of 2020 Financial Times One of the Most 2020 Books of 2020 Washington Post One of the Best Science Books of 2020 The Times of London One of the Best Science Books of 2020 The Guardian From ideas and infections to financial crises and fake news an utterly timely look at why the

science of outbreaks is the science of modern life These days whenever anything spreads whether it s a YouTube fad or a political rumor we say it went viral But how does virality actually work In *The Rules of Contagion* epidemiologist Adam Kucharski explores topics including gun violence online manipulation and of course outbreaks of disease to show how much we get wrong about contagion and how astonishing the real science is Why did the president retweet a Mussolini quote as his own Why do financial bubbles take off so quickly Why are disinformation campaigns so effective And what makes the emergence of new illnesses such as MERS SARS or the coronavirus disease COVID 19 so challenging By uncovering the crucial factors driving outbreaks we can see how things really spread and what we can do about it Whether you are an author seeking an audience a defender of truth or simply someone interested in human social behavior *The Rules of Contagion* is an essential guide to modern life

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