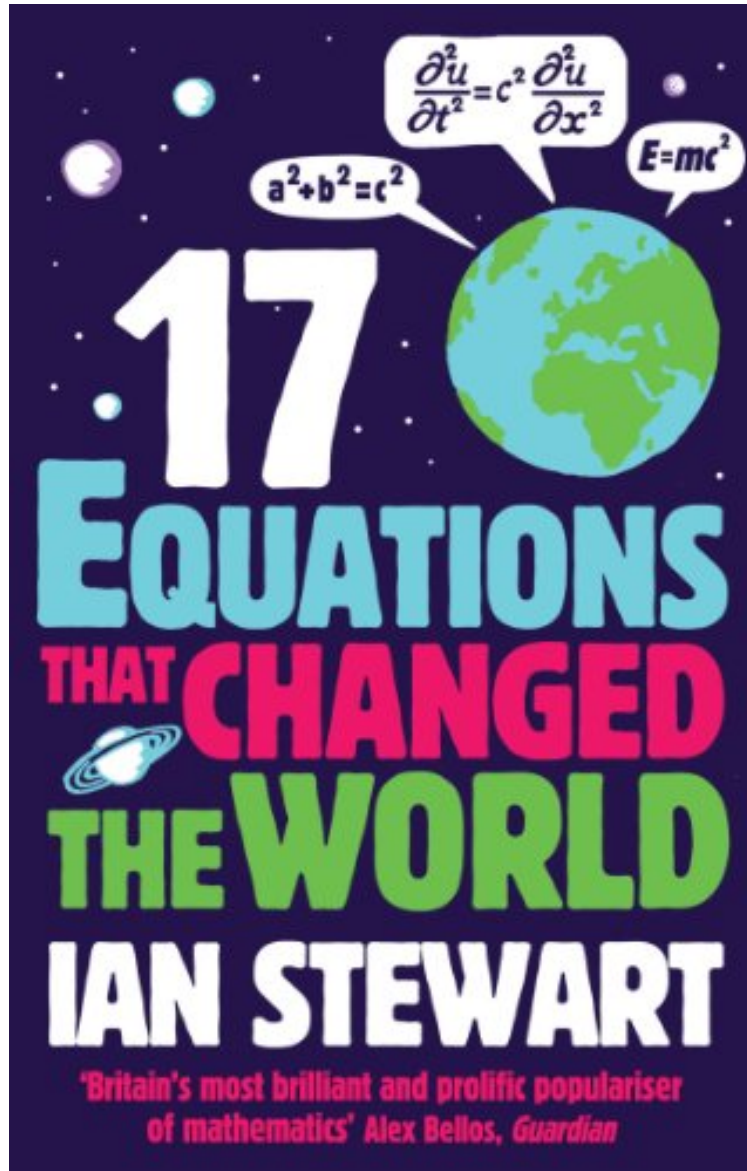


(Download pdf) Seventeen Equations that Changed the World

## Seventeen Equations that Changed the World

*Ian Stewart*

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**Ian Stewart : Seventeen Equations that Changed the World** before purchasing it in order to gage whether or not it would be worth my time, and all praised Seventeen Equations that Changed the World:

4 of 4 people found the following review helpful. One to Read and Read Again.By TintinnabulationThis is one of those well written books that will be of interest to scientists, mathematicians, engineers, physicists and others who enjoy expanding their understanding of our physical universe. It has been many years since I studied and used

university level math and science, so a deep understanding of the 17 equations in their mathematical forms was beyond my remaining knowledge skills. Fortunately, the well written chapters after introducing the equations were a joy to read and led to much understanding. I fully intend to come around and go through it again later this year or next so I can grasp more. More than likely, I'll not be able to appreciate the deep meaning of the equations, but the chapter material is so full of material to savor and ponder that the second (or third) time going through the book will be a joy to repeat.

2 of 2 people found the following review helpful. This is a good book, which should be required reading for serious math students and teachers. By Russell H. Logan Professor Stewart selected 17 equations that changed the world. He discusses each equation in an engaging and practical manner, and he gives a number of illustrations of how those equations have and are impacting our lives. One could argue whether these 17 equations completely describe our civilization, or whether all should be included (unless you happen to work or be interested in special areas, such as communications or signal processing - in which case, those equations governing propagation and information theory are of major importance.) Indeed, the author frequently points out that the equations are not independent, but richly interrelated. One can not argue that Professor Stewart doesn't give thoughtful discussions of the development and meaning of each equation. He presents many detailed references and side stories of how the equations were developed, the "blind alleys" pursued, those who opposed or aided in their development, and the time periods involved. Indeed, the author gives sufficient historical detail to satisfy ordinary history "buffs". These humanity references, together with treatment of the mathematic principles, ensures well rounded satisfaction to the reader. I do not recommend one speed-read this book, but rather cover one equation at a sitting while reading in a contemplative manner. Professor Stewart gives ample reasons for anticipation of future improvements or changes in mathematical descriptions of the world(s) in which we live. For example, he challenges the reader with the exciting possibility of how dark matter may change our understanding of the universe: he does this best in the final chapter, "Where Next?" The potential for string theory, general universal theory, and the Higgs Boson creates an atmosphere of anticipation and the need to learn more - that is a major credit to the author!

Structurally speaking, this book is constructed so that each equation or chapter is virtually independent of the preceding chapter. This is very convenient, allowing the reader to select which equation to study, without the necessity of thumbing back to prior chapters to clarify some reference. I had one surprising disappointment on accuracy or proof reading, when the author, on page 40, states that the note, middle C, is 440 cycles per second. This dismayed me, because it made me doubt many other bits of referenced information, which makes this book so interesting. This mistake was not repeated in the chapter on wave motion - which restored my confidence and caused me to forgive this one error, however blatant. All in all, this is a commendable book, one which spurs the imagination, and increases the understanding of mathematical equations. I recommend this book to all students of mathematics and those responsible for teaching the subject to others.

3 of 3 people found the following review helpful. Entertaining description of some of our most important equations. By A. Menon Ian Stewart is a master of writing mathematics that can be understood. This latest addition to his literature brings to the casual reader 17 of the equations the author believes have changed the world. Some will be known to almost all and some are more embedded in everyday use rather than everyday knowledge. But the authors ability to describe the equations, history and importance follows in each of his chapters. The equations covered starts with Pythagoras's Theorem, then discusses logarithms, the limit equation in calculus, Newton's gravity, the properties of  $i$ , Euler's formula for topology, the normal distribution, the wave equation, the Fourier transform, Navier-Stokes, Maxwell's equations, the second law of thermodynamics,  $E=MC^2$ , Schrodinger's equation, Shannon's theorem in information theory, basic chaos from dynamical systems and the Black-Scholes equations. From the first chapter the author brings illumination to his topics combining intuition with his insight. For example in Pythagoras's Theorem, the author discusses its properties, how it was interpreted (as relation of areas, as relation of triangle etc) to what it tells us about geometry. Most of us are familiar with the equation but some subtle but very important details are provided and pondered - with a result that creates a certain awe. The book is filled with insight and description that can be understood by the casual reader. This is not a math book, some of the chapters have some relatively sophisticated mathematical ideas, but they are peripheral rather than core to the chapter. The book gives a sense of history and describes much of the practical significance of the math the author introduces. I highly recommend this to all interested in how math affects the real world in application as well as to those just interested in the history some of our most important equations.

"An engaging tour of vital math for a modern world.... [A] wonderfully accessible book."--Scientific American

"Stewart shares his enthusiasm as well as his knowledge in this tour of ground-breaking equations and the research they supported.... An entertaining and illuminating collection of curious facts and histories suitable for random dipping-in or reading straight through." Publishers Weekly "Stewart provides clear, cogent explanations of how the equations work without burdening the reader with cumbersome derivations.... He gives a fascinating explanation of how Newton's laws, when extended to three-body problems, are still used by NASA to calculate the best route from Earth to Mars and have laid the basis for chaos theory. Throughout, Stewart's style is felicitous." Kirkus "Seemingly basic equations have enabled us to predict eclipses, engineer earthquake-proof buildings, and invent the refrigerator. In this

lively volume, mathematician Ian Stewart delves into 17 equations that shape our daily existence, including those dreamed up by the likes of Einstein, Newton, and Erwin Schrödinger. "Discover" Stewart is the finest living math popularizer—a writer who can tackle eye-spraining mathematical topics approachably, and yet dazzle hard-core nerds with new and surprising information. It is hard not to get your money's worth from him, and in a book like this he is at his best because of the very wide ground covered. "Maclean's" Stewart's expertise and his well-developed style (enhanced by a nice sense of humor) make for enjoyable reading.... [A] worthwhile and entertaining book, accessible to all readers. Recommended for anyone interested in the influence of mathematics on the development of science and on the emergence of our current technology-driven society. "Library Journal" Stewart has managed to produce a remarkably readable, informative and entertaining volume on a subject about which few are as well informed as they would like to be. "Washington Independent of Books" Stewart is a genius in the way he conveys his excitement and sense of wonder.... He has that valuable grasp of not only what it takes to make equations interesting, but also to make science cool. "New York Journal of Books" About the Author Ian Stewart is Emeritus Professor of Mathematics and active researcher at the University of Warwick. He is also a regular research visitor at the University of Houston, the Institute of Mathematics and Its Applications in Minneapolis, and the Santa Fe Institute. His writing has appeared in New Scientist, Discover, Scientific American, and many newspapers in the U.K. and U.S. He lives in Coventry, England.