

Index

- 21-point cubic 128
85 Ways to Tie a Tie, The 21
- Alcuin of York 3
 d'Alembert, Jean le Rond 75, 150
 Alexander, C. H. O'D. 51
 Alekhine, Alexander 210
 d'Ambrosio, Ubiratan 225
 annotations 46
 Apobates 218, 219
 Apollonius of Perga 88, 93, 149, 159
 Appel, K. I. & Haken, W. 145
 Archimedes 108, 123, 133
 Archimedes' lemma 171
 Argand, Jean Robert 201
 Aristotle 166, 217, 218, 221
 Atiyah, Michael 120, 152, 226
- Bacon, Francis 214
 Bailey, David 143, 147
 Bailey-Borwein-Plouffe formula 147
 Bakshali manuscript 4
 bell ringing 218
 Berlekamp, Elwyn 38, 62
 Berne, Eric 218
 Bernoulli, James 112
 Bieberbach, Ludwig 226
 billiards 164–165
 Binsberge, Wim van 222–223
 Bishop, Alan 227
 bishop path puzzle 33
 blind mathematicians 41
 Boas, Ralph 51
Board Game Studies 57
 Boorman, Scott 45
 Borwein brothers 136, 142
- Borwein, Jonathan 143, 147
 Bourbaki 214, 227, 228
 Bouton, Charles 38
 Brahe, Tycho 149
 braids 2, 233
 Bridges of Königsberg 9–11, 43, 56, 61
 Brilliancy (Beauty) prize 210
 Brocard, Henri 126
 Bronstein, David 51
 Brouwer's fixed point theorem 28
 Browne, Cameron 29
 Buckyball 223–224
 Bunimovich stadium 166
- Cake-Cutting Algorithms* 21
 calculating prodigies 142
 Cardan, Gerolamo 136
Catoptrica 163
 Cavalieri, B. F. 153
 Cayley, Arthur 119
 Ceva, Giovanni 88–89
 Chen, Master 173
 chess 29–35, 52–53
 chess, blindfold 16
 Chinese mathematics 35
 Chinese dissections 172
 Clarke, Shirley 48–49
 Coates, Roger 99
 Cohn-Vossen 51
 Combinatorial Game Theory 38–39
Commentary on the Nine Chapters 173
Community of the Future, The 31
 competition 54
 Constable, John 189
 Conway, John Horton 37, 38, 55

- Copernicus, Nicolaus 149
 Cuisenaire rods 75, 77
 Culin, Stewart 222
 cycloid 160
- Dandelin's spheres 93–94
 Davis, P. J. 123, 127
 Deep Blue 37
 Descartes, René 65, 115, 143, 157, 159, 160, 190
 Dido, Queen of Carthage 168–169
 Dieudonné, Jean 58, 171
 Dirac, Paul 232
 divergent series 49, 111
 divisor function 79–80
 Dudeney, Henry Ernest 24, 71
 Dyson, Freeman 214
- Egypt 1, 3
 Eight Queens puzzle 23
 Einstein, Albert 31, 85, 148, 150
Emergence of Fun Morality, The 222
enri calculus 161
 Epstein, D. 143
 Eratosthenes' sieve 64, 133–134, 197
 Erdős, Paul 228
 ethnomathematics 225
 Euclid 49, 75, 90, 93, 134, 227
 Euclid, *Elements* 49, 85, 98, 169
 Euler, Leonhard 9–15, 40, 61, 65, 73, 75, 84, 99, 110, 111–114, 126, 131, 138, 142, 169, 213, 215, 226
 Euler line of triangle 123–125, 128
 Euler's constant 113
 Euler's relation for polyhedra 115–116, 224
 Euwe, Max 47
Everybody's Illustrated Book of Puzzles 11
Exemplum memorabile inducionis fallacis 138
Experimental Mathematics (journal) 143
Experimental Mathematics (book) 147
- Fatou dust 212
 Fermat, Pierre de 155–156, 157, 159, 167, 207, 213
 Fermat's Last Theorem 46, 55, 162
 Feuerbach, K. W. 126
 Fibonacci 3, 54
 Fibonacci sequence 131
 Fine, Reuben 230
- Fink, Thomas 21
 Fisher, M. E. 71
 four-colour theorem 144–145
 Frege, Gotlob 73
- Gale, David 28
 Galileo 50, 60, 148, 157
 game (gamen) 219
 Game of Letter-Board 76
Game of Life, The 37, 55
Games People Play 218
 Gamow, George 52
 Gasser, Ralph 26
 Gauss, Carl Friedrich 84, 114, 131, 140, 142, 143, 177, 197, 226, 233
Geometria Indivisibilibus 153
Geometry and the Imagination 51
 Go 35–39
Go Proverbs Illustrated 52
 Goldbach's theorem 135–136
 Golomb, Solomon 23–24
 Goodtsein, R. L. 76
 Grandi, Guido 112
 Greek mathematics 2, 60, 96, 126, 127, 148, 150
 Gregory, James 109–110
 groups 119, 218
 Grundy, Patrick 38
 Guy, Richard 38, 57
- Hadamard, Jacques 140, 226
 Halley, Edmund 149
 Halmos, Paul 214
 Hamilton, William Rowan 6
 Hamming, Richard 35
 harmonic series 111
 Hardy, G. H. 63–64, 133, 135, 141, 208–209, 226
 Hardy–Weinberg law 208
 Heavyside, Oliver 151–152
 Hein, Piet 26
 Henle, Jim 211
 Heron of Alexandria 163
 Heron's theorem 166, 167, 168
 Hex 26–29, 52, 142
Hex Strategy 29
 Hilbert, David 31, 51–52, 57, 215, 228
History of Board Games 222
 Hofstadter, Douglas 143–144
 Hofstadter's sequence 144
 Huxley, T. H. 122

- Icosian Game, The 6
 intuition for the abstract 58, 171
 Inversion, geometrical 202–204
- Japanese mathematics 35, 141, 161
 Jacob's ladder 2
 Jeffreys, Harold & Bertha S. 153
 Josephus puzzle 5
 Joxe, Louis 221
 Julia set 211
- Kac, Mark 228
 Kanada, Yasumasa 66
 Kasparov, Gary 37, 84
 Kastelyn, P. W. 71
 Kepler, Johannes 60, 149, 167, 184
 Kiepert, Ludwig 127
 Klein, Felix 55, 226, 228
 Kline, Morris 113
 knight tours 12–16, 61
 knots 2, 217, 231–233
 Koltanowski 16, 40
 Kowa, Seki 161
- Lasca 31
 Lakatos, Imre 117
 Lasker, Emanuel 31
 LEGO 7
 Lehman R. S. 136
 Leibnitz, G. W. 11, 54, 109–110, 112, 152,
 161, 207, 217, 226
 Lemoine, Emile 126
 Leonardo da Vinci 189, 217
 Levy, S. 143
Liber Abaci 3
 Lionnais, François Le 211
 Liouville, Joseph 75, 80–81
 Listing, Johann 233
 Littlewood, J. E. 135, 141, 147, 213
 Liu Hui 173, 180
 Longchamps, G. de 127
 Loomis, Elijah S. 188
 Lucas, Édouard 17–21
 lucky numbers 197
 lucky Goldbach conjecture 198
ludus calculorum 77
- Maclane, Saunders 120, 141, 152, 226
 Madhava 109, 110
 Mallows, C. L. 55
 Mandelbrot, Benoit 211, 227, 229
- Manin, Yuri 185
 Mao, Yong 21
Mathematical Go 38, 62
Mathematician's Apology, A 63
 Matsuzaki, Kiyoshi 77
 Maupertuis, Pierre de 167
 Mehen, game of 1
 Menelaus 89
 Merchant's Problems 6
 Mersenne number 20
Methods of Mathematical Physics 153
 minimal surface 195
 Morin, Bernard 41
 Murray, Harold 222
- Nagel, Christian 127, 128
 Napoleon's theorem 128, 173–175
 Nash, John 26–28
 Neuberg, Joseph 127
 Neumann, John von 58–59, 162, 212, 213, 220
 Newell Alan 37
 Newton, Issac 54–55, 60, 109, 143, 149, 160,
 167, 168, 207, 226
 Nichomachus 177, 180
 Nine Men's Morris 25–26, 52, 62, 142
 nine-point circle 126
 Noether, Emmy 31, 141
 normal numbers 66
- ocean plait 232
 odd perfect numbers 98
 Oldenburg, Henry 207
On divergent series 112
On the quadrature of the parabola 108
 optics 162
Oranges and Lemons 220
 Oresme, Nicholas 110, 111–114
- Papert, Seymour 230
 Pappus 169
 parabola 93, 190, 206
 partitions 180–182, 213
 Pascal, Blaise 152, 157, 160
 Pascal's triangle 19, 68, 137
 pentagonal numbers 178
 pentagonal number theorem 81–83
 pentominoes 23, 61, 71
 Piaggio, H. T. H. 151
 Plato 148, 150, 219
 play (plegian) 220
 plinthios 2

- Poe, Edgar Allan 226
 Poincaré, Henri 55, 73, 184, 208, 213
 Polster, Burkhard 22
 Polya, George 75, 136
 polygonal numbers 176–180
 Poncelet, Jean Victor 205–206
 Pontryagin, Lev 41
 Porphyry 44
 prime numbers 20, 133–135
 Primrose, E. J. F. 76
problema 86, 88, 225
Proofs and Refutations 117
Propositions to Sharpen the Young 3
Protracted Game, The 45
 Pythagoras 150
 Pythagoras' theorem 79, 127, 128, 184, 189, 210
Psychology of Invention . . . , The 226
Pythagorean Proposition, The 188
- radian 58, 99
 Ramanujan, Srinivasa 84, 141, 147, 213
Récréations Mathématiques 17
 Rényi, Alfréd 228
 Rhind papyrus 3
 Robertson, Jack 21
 Roberval, G. P. De 157, 159
 Romanticism 219
 Rota, Gian-Carlo 220
Rules of Lasca, The 31
 Russell, Bertrand 44, 182
- Saunderson, Nicholas 41
 Schikard, Wilhelm 152
 Schneider, Walter 198
 Schultz, Daniel 138–140
 Schwarz, Hermann 195
 science 60
 Segoe, Kensaku 52
 Seven-Circle Theorem 129, 204
 shape 105–107
 Shelah, S. 214
Shoelace Book, The 22
 Simon, Herbert 37
 Simson's line 90
 Singmaster, David 213
- skew quadrilateral 193–194
 Snell, Willebrod 167
sona 225
 Sprague, Roland 38
 statue puzzle 5
 Stein, E. M. 214
 Steiner's porism 203–204
 Stewart, Ian 229
 string figures 1
Struggle 31
 sums of squares 132
 Sylvester, James 122–123, 146, 226
- Tanaka, M. 136
 tangent 102–104
 Tartaglia 3
 Temperley, H. N. V. 71
theorema 86, 88, 225
 Thurston, William 140
 Tonietti, Tito 213
 topology 2, 11, 16
 Toricelli, Evangelista 157
 Tower of Hanoi 17–19, 38, 43, 52, 56, 58
 triangle geometry 123
 Turkle, Sherry 230
TwixT 29
- Ulam, Stanislav 197
- Voltaire 51
- Wallis, John 153
wasan 141, 161, 162
 Webb, William 21
 Weyl, Hermann 74, 145
 Whitehead A. N. 221
 Wigner, Eugene 151
 Wiles, Andrew 46, 55, 120
 Wood, Thomas 77
 Wolfe, David 62
 Wolfenstein, Martha 222
 women and mathematics 229–230
Winning Ways 38
- Zeilberger, Doron 146
Zhoubi suanjing 173