

Subject Index

Many of these terms are defined in the glossary, others are defined in the *Prime Curios!* themselves. The **boldfaced** entries should indicate the key entries.

γ 97

ϕ 79, 184, *see* golden ratio

π 8, 12, **90**, 102, 106, 129, 136,

154, 164, 172, 173, 177, 181,

187, 218, 230, 232, 235

5TP39 **209**

absolute prime 65, 146, **251**

abundant number **103**, 156

aibohphobia 19

aliquot sequence **13**, 98

almost-all-even-digits prime **251**

almost-equipandigital prime **251**

alphabet code **50**, 52, 61, 65, 73,

81, 83

alphaprime code **83**, 92, 110

alternate-digit prime **251**

Amdahl Six 38

American Mathematical Society

70, 102, 196, 270

Antikythera mechanism 44

apocalyptic number 72

Apollonius 101

Archimedean solid 19

Archimedes 25, 33, 101, 167

Arecibo Message 55

arithmetic progression **34**, 81,

104, 112, 137, 158, 205, 210,

214, 219, 223, 226, 227, 236

Armstrong number 215

Ars Magna 20

ASCII **66**, 158, 212, 230

atomic number 44, 51, 64, 65

Australopithecus afarensis 46

autism 85

autobiographical prime 192

averaging sets **186**

Babbage 18, 146

Babbage (portrait) 147

balanced prime 12, 48, 113, **251**

Balog 104, 159

Balog cube 104

baseball 38, 97, 101, 116, 127,

129

beast number **109**, 129, 202, 204

beastly prime 142, 155, 229, **251**

bemirp 113, 191, 210, **251**

Bernoulli number 84, 94, 102

Bernoulli triangle 214

- Bertrand prime **211**
 Bertrand's postulate 111, 211, **252**
 Bible 23, 45, 49, 50, 59, 72, 83, 85, 109, 158, 194, 216, 235, 236
 Bidder 44
 birthday 32, 42, 47, 85, 89, 130
 blackjack prime **114**
 bowling 78, 83, 84
 Brahmagupta 11
 Broadhurst 169, 240

 California 34, 46, 95, 105, 108, 110, 158, 206, 243, 269
 Cauchy (portrait) 120
 ceiling function **252**
 centered square number 99
 certificate of primality **252**
 chaos theory 226
 Chen prime 44, 72, 89, **252**
 chess 8, 10, 12, 26, 32–34, 75, 82, 130, 137
 Christianity 86
 cigarettes 15
 circular prime 156, 181, **252**
 circular-digit prime 59, 106, 140, 147, 171, 180, 189, **252**
 Clay Mathematics Institute 15
 clock 5, 18, 77, 98, 104, 115, 128, 171, 174, 175, 246
 Cogitata Physico-Mathematica 258
 Collatz 91
 Colorado 116
 Columbian number **126**
 compass and straightedge 25, 37, 166, 167
 composite (definition) **252**
 composite-digit prime 59, 136, **252**
 computer mouse 187
 congruence **252**
 congruent prime 29, 196, 203, 213, 222, 227, 234, 237, **253**
 constructible number **167**
 convenience store number **125**
 convenient number **38**, 153
 Conway 29, 53, 113, 207
 coprime 171, **253**
 cousin prime 8, **253**
 Crandall 64, 96, 199, 243, 270
 Cremona group (of spaces) 117
 Crux Mathematicorum 199
 cryptarithm 12, 188
 cryptology **253**
 cuban prime 17, **253**
 Cullen prime 234, **253**
 Cunningham chain 59, 192, 223, 232, **253**
 curved-digit prime 58, 170, **253**
 Cypher prime 49, 235

 dart 63
 De Polignac's conjecture 7
 decimal expansion 12, 29, 35, 90, 94, 97, 102, 115, 129, 147, 154, 160, 164, 173, 175, 177, 184, 186, 187, 190, 213, 218, 222, 226, 230, 232, 235, 237
 deficient 103
 Delannoy number **176**
 deletable prime 205, 229, **253**
 Delian constant **115**, 167
 Dell OptiPlex 745 241
 deltoid 9
 depression prime 213, **254**
 Descartes 119
 digital root 16

- dihedral prime 174, **254**
 Diophantine equation **129**
 Dirichlet's theorem **254**
 divisor 7, 13, 72, 86, 98, 103, 130,
 160, 172, **254**
 Durga Yantra 42
 dwarf planet 18, 86

e **83**, 186, 206, 222
 Earth 51, 64, 80, 92, 94, 111, 115,
 125, 128, 134, 146, 163
 eban 7
 eclipse 16, 125
 economical number **254**
 ECPP 240, **254**
 Edison 49, 113, 185
 Edison (portrait) 113
 EDSAC 124, 236
 Egyptian fraction 202
 Eisenstein (portrait) 33
 Eisenstein prime 156, **157**
 Electronic Frontier Foundation
 244, 248
 elements (chemical) 64
 Elements (Euclid's book) 31, 33,
 34, 45, 258, 261
 ElevenSmooth 18
 elite prime **211**
 elliptic curve 20, 90, 137
 emirp 19, 22, 25, 36, 38, 40,
 71, 72, 111, 113–115, 117,
 118, 131, 134, 144, 146, 147,
 153, 156, 170, 171, 173, 174,
 176, 179, 181, 182, 184, 185,
 189–193, 195, 202, 203, 205,
 207, 215, 217, 221, 228, 233,
 254
 equidigital number 72, **254**
 Eratosthenes 101, 114, 161
 Erdős 18, 26, 53, 58
 Erdős (portrait) 112
 Erdős number 12, **111**
 Escher 53
 Euclid 4, 11, 31, 33, 34, 45, 101
 Euclid (portrait) 31
 Euler 7, 9, 38, 40, 41, 74, 101,
 120, 153, 192
 Euler (portrait) 38
 Euler zeta function **254**
 Euler's formula 7
 Euler-Mascheroni constant **97**
 extravagant number **255**

 factor (definition) **255**
 factorial prime 103, 193, 241, **255**
 Feigenbaum 226
 Feit-Thompson conjecture **173**
 Fermat (portrait) 118
 Fermat number, viii 10, 101, 176,
 211, 227, **255**
 Fermat prime 9, 23, 132, 165–167,
 212, **255**
 Fermat's Last Theorem 8, 16,
 114, 121
 Fermat's little theorem **255**
 Ferrier 233, 244
 Feynman Point 106
 Fibonacci number, viii 12, 21, 23,
 36, 39, 47, 77, 79, 114, 115,
 139, 165, 169, 175, 178, 200,
 222, **255**
 Fibonacci prime 11, 79, 138, 160,
 178, **255**
 Fields Medal 101
 fine-structure constant 70
 Fischer 33, 75
 floor function, viii **255**
 Florida 72, 77, 139, 143
 FORMULA 409 91
 Fortunate number 8, **255**

- four 4's puzzle **54**, 238
 Fractran algorithm 29
 Franklin (portrait) 140
 Franklin square 68
 Freud 29, 122
 full period prime 139, 211, **260**
 gap 33, 69, 102, 114, 122, 123,
 131, 137, 164, 182, 184, 204,
 216, 218, 237, **256**
 Gardner 73, 89, 203
 Garfield 56, 121
 Gauss 3, 21, 25, 33, 120, 166, 177
 Gauss (portrait) 120
 Gaussian Mersenne prime 182,
 256
 Gaussian prime 182, **183**
 gematria 69
 generalized Cullen prime **256**
 generalized Fermat prime **256**
 generalized repunit 36
 generalized repunit prime **256**
 Genocchi number **25**
 geometric progression 173
 Georgia 127, 160
 Germain (portrait) 121
 gigantic prime 240, **256**
 Gilbreth 22
 GIMPS 241, 245, **256**
 Giza prime **209**
 Glaisher 122
 Go **27**, 128
 Goldbach's comet 148
 Goldbach's conjecture 16, 23, 148,
 256
 golden ratio **79**, 147, 184, 213
 good prime 12, **256**
 Google 155, 177, 206
 googol 62, 154, 210
 Grand Canyon 84
 Great Library of Alexandria 101
 Gridgeman pair **75**, 89, 185
 Grothendieck 45
 Hadwiger problem 47
 Ham the Astrochimp 139
 happy number **14**, 53, 128, 207
 Hardy 25, 28, 77, 87, 97, 135,
 155, 196
 Hardy-Ramanujan number **28**,
 135, 155, 196
 Harry Potter 185
 Hawaii 61, 69
 Heaven's Gate 135
 Heegner number 73
 hendecagon 19
 heptagon 41
 heptomino 63
 hexadecimal 48, 147, 212, 217,
 222, 240
 hexagon 29, 50, 53, 58, 96, 222
 high jumper **256**
 Hilbert 30, 81
 Hill 881 108
 holey prime 59, **257**
 home prime **223**
 Honaker's problem 50, **257**
 Human Genome Project 105
 hypocycloid 9
 IBM 35, 54, 103, 135, 156
 iccanobiF emirp 146
 iccanobiF prime 106, **257**
 idoneal number **38**
 illegal prime 238, **257**
 Illinois 40, 73, 152
 inconsummate number 74
 Indiana 98
 integer (definition) **257**
 Introductio Arithmetica 103

- invertible prime 30, 140, 142, 173, 178, **257**
 Iowa 72
 irregular prime 40, 49, 94, 102, **257**
 Ishango bone 26
 Islam 86, 100

 Jeopardy! 130, 154
 Johnson solid 58
 jumping champion **257**

k-tuple **257**
 Kabbalah 69
 Kasparov 130
 Keith number **26**
 Kentucky 17, 35, 61, 90, 120, 125
 KJV Bible 23, 45, 49, 50, 59, 85, 216, 235, 236
 knight's tour 62, 94
 Knuth 111

 Lagrange 8, 19
 Latin square 184
 Lebombo bone 33
 Leetspeak 169
 Leeuwenhoek 91
 left-truncatable prime 106, 135, 144, 182, 189, 201, 224, 227, 232, **257**
 left/right-truncatable prime 216
 Legendre's conjecture **258**
 Lehmer 13, 30, 52, 63, 67, 174, 190, 200, 217
 Les Nombres Premiers 233
 Leyland prime **232**
 Liber Abaci 255
 life, game of 113
 light-year 92, 165
 Littlewood 56

 logarithm, viii 7, 52, 66, 69, 83, 99, 108, 160, 177, 245, **258**
 London 18, 32, 42, 95
 look-and-say **191**
 Lucas (portrait) 232
 Lucas number 71, 76, 116, 127, 142, **258**
 Lucas prime **258**
 lucky number 9, **9**, 21, 41, 43, 77, 128, 132, 144
 Lucy 46
 Lychrel number **102**

 Madonna's sequence **230**
 magic square 29, 49, 55, 68, 80, 108, 112, 134, 139, 203
 magic sum 43, 68, 127
 Magna Carta 25
 Maine 53
 Massachusetts 25, 40, 206
 mathematical black hole 131
 Mathematical Association of America 102, 269
 Matijasevič **39**
 maximal prime gap 122, **123**
 mean prime gap 33, 131, 182, 216
 megaprime 125, **258**
 Mercury 126, 128, 139
 Mersennary **258**
 Mersenne $2^{13466917} - 1$ (stamp) 192
 Mersenne (portrait) 23
 Mersenne number, viii 35, 52, 78, 101, 134, 135, 147, 198, 244, **258**
 Mersenne prime 10, 12, 35, 36, 38, 41, 42, 63, 66, 95, 96, 135, 147, 150, 152, 156, 158, 159, 182, 223, 228, 232, 241, 243, 244, **258**, 267

- Mertens function 62, 76
 Michigan 34, 86
 Millennium Prize Problem 15
 Mills' prime 240, **258**
 minimal prime 107, 194, 226, 230, **258**
 Mississippi 34
 modular arithmetic (mod) **4**
 Mole Day 32
 moon 15, 16, 40, 46, 80, 125, 126, 168
 Moore's Law **246**
 primal, *see* primal Moore's law
 Moser's Circle problem 36, 75
 mosquitoes 45
 Motzkin number 218
 mountain prime 69, 216, 217
 movie 38, 40, 47, 48, 53, 58, 61, 62, 69, 85, 86, 91, 110, 118, 119, 124, 143, 161, 164, 180, 235, 240
 Mozart 42, 80
 multifactorial prime **259**

 Napier 52
 narcissistic **215**, 227
 NASCAR 44, 61
 naughty prime **259**
 near-repdigit prime 158, 169, **259**
 near-repunit prime **259**
 Nebraska 130
 New Jersey 76
 new Mersenne conjecture **259**
 New York City 37, 42, 45, 47, 49, 64, 91, 109, 151
 Newton (portrait) 53
 NGC 613 99
 Nicomachus 103
 Nobel 40, 106, 168

 Noether 43
 non-generous prime **163**
 North Carolina 20
 North Dakota 29
 NSW prime 142, **259**
 NUMB3RS 11
 number theory 2, 47, 122, 124, 187, 230, **259**
 numerus idoneus 153

 Oklahoma 129, 131
 On-Line Encyclopedia of Integer Sequences 79
 OP-PO prime **174**
 ordinary prime 240, **259**
 Ormiston k -tuple **122**, 191, 206
 Oxyrhynchus papyrus 34

 palindrome 17–19, 59, 75, 79, 100, 102, 109, 126, 129, 153, 202, 226, 232, **259**, 268
 palindromic prime 17, 61, 72, 75, 76, 81, 86, 88, 90, 93, 109, 110, 137, 143, 144, 151, 152, 154, 155, 160, 168, 171, 172, 182, 184, 185, 187, 189, 190, 196–199, 201, 202, 205, 207–210, 213, 214, 217, 218, 221–223, 225, 227–230, 232, 233, 235, **259**, 268
 palindromic reflectable prime 185, **260**
 pandigital prime 203, 204, 207, 208, 211, 219, **260**
 Pappus 101
 parallax 51
 Parthenon 25
 partition number **192**
 Pascal (portrait) 79
 Pascal's triangle 214, 215, 221

- patent number 168, 185, 187
 peg solitaire 74
 Pell number 139, **139**, 209
 Pennsylvania 34, 74
 pentagon 166, 167
 pentomino 113, 128
 perfect number 71, 86, 121, 125,
 131, 195, **260**
 period 10, 14, 35, 39, 41, 50, 53,
 62, 72, 79, 84, 94, 107, 125,
 139, 163, 164, 168, 182, 199,
 211, 212, **260**
 Perrin sequence **96**
 persistence **76**, 205, 206, 226
 Photoelectric Sieve 66, **67**, 174,
 200
 Pi Day 54
 Pierpont prime **260**
 Pillai prime **260**
 plateau prime **260**
 Platonic solid 11
 Pluperfect Digital Invariants 215
 Polaris 92
 polyomino 63, 113, 128, 136, 175
 Pomerance 64, 71, 96, 199, 243,
 270
 primal Moore's Law 247
 primary pretender **84**
 Prime Circle **208**
 prime counting function, viii 108,
 138, **260**
 prime curiologist 61, 110, **260**
 prime number (definition) **260**
 prime number theorem 26, **261**
 prime period length 72
 Prime Period Lengths 182
 prime quadruple 26, 73, 107, 126,
 156, 177, 191, 240
 prime race 93, **159**, 197, 203, 212
 prime rotative twin 178, **261**
 prime time 115, 128, 171, 174,
 175
 prime-digit prime 197, **261**
 primeval number 71, 154, **261**
 primitive root 76, 163
 primorial, viii 116, 126, 129, 236,
 261
 primorial prime 126, **261**
 Principia Mathematica 90
 probable prime 107, **261**
 proper divisor 7, 13, 103, **261**
 Proth prime 156, **261**
 pseudoprime **262**, 268
 public-key cryptography 187, **262**
 pyramid 102, 108, 143, 155, 202,
 209, 230, 233, 235
 Pythagoras (portrait) 89
 Pythagorean 7, 10, 13, 45, 50, 89,
 100, 195
 Qur'an 26, 35
 Ramanujan prime 19, **262**
 Ramanujan's constant 73
 Ramanujan's tau 102, **228**
 reflectable prime 8, 180, 185, **262**
 regular prime 94, **262**
 repfigit **26**, 51, 76, 216
 repunit prime 18, 87, **112**, 181,
 197, **262**
 reversal 19, 27, 28, 30, 33, 40, 42,
 44, 45, 48, 50, 52, 58, 59, 65,
 73, 75, 78, 81, 83, 94, 95, 102,
 104, 106, 107, 115, 126, 127,
 131, 135, 163, 168, 187, 189,
 191, 194, 204, 208, 211, 218,
 222, **262**
 reverse-then-add **59**, 102, 126,
 153

- reversible prime 120, 173, 237,
 262, 268
 Rhind papyrus 27
 Ribenboim 151, 269
 Riemann hypothesis 11, 30, 56,
 77, 129, 203, **262**
 Riemann zeta function 84, 203,
 263
 Riesel number **178**, 213
 right-truncatable prime 58, 85,
 106, 159, 195, **263**
 right-truncatable semiprime 232
 Ripley's Believe It or Not 223
 rocket 41, 46, 135
 Roman numeral 40, 52, 111, 116,
 228
 rooted tree 103, 170
 roulette 40
 RSA algorithm 148, 187, **263**
 RSA number 99, **263**
 Rubik's cube 174, 224
 ruler 8
 Russell 90
 Ruth-Aaron pair **116**

 safe prime 12, **263**
 Sagan 56, 119, 177
 Saint-Prime 98
 satellite 36, 92, 163
 Sautoy 111, 125, 270
 Scientific American 2, 73, 148
 self prime **126**
 self-descriptive prime 190, 224,
 263
 Selfridge 135, 228
 semiprime 25, 54, 55, 82, 84, 156,
 163, 164, 232, **263**
 Seventeen or Bust **23**, 156, 245
 sexy prime 11, **263**
 Shakespeare 31, 38, 60

 Sharkovsky's theorem 10
 Shibuya 109 64
 Siamese prime 171
 Siamese twin 12
 Sierpiński number **23**
 Sieve of Eratosthenes 114, 161,
 162, **263**
 Simpsons, The 80, 188
 Skewb Diamond **174**
 Skewes' number 2, 4
 Sloane 79, 81, 124
 Smarandache 104, 116, 226, 229,
 238
 Smarandache-Wellin prime 104,
 116, **264**
 Smith number **166**, 179
 smoothly undulating 61, 182, 208,
 217, **264**
 snowball prime **264**
 sonnet rhyme scheme 214
 Sophie Germain prime 59, **121**,
 146, 232, **264**
 Sotades the Obscene 18
 square root 27, 54, 56, 64, 126,
 161, 182
 squarefree **23**
 squareful 31, 72
 stamp 7, 133, 152, 192, 219
 Star Trek 8, 37, 45, 56, 89
 stegosaurus 24
 Stern **117**
 Stirling's series 71
 straight-digit prime 116, **264**
 strobogrammatic 58, 82, 88, 100,
 173, 178, 182, 189, 201, 212,
 216, 227, **264**
 sudoku 24, 221
 sun 15, 16, 27, 41, 51, 64, 80, 94,
 105, 128
 supersingular prime 53

- SWAC 95, 245
 Szekeres 53

 Taniyama 114
 Tao 8, 104
 tattoo 136
 tau function 102
 Tennessee 34, 36, 87
 Tetractys 100, 142
 tetradic prime 85, 196, **264**
 Tetragrammaton 142
 Texas 25, 84, 102, 159, 165
 Thâbit number **13**
 Theodorus of Cyrene 21
 ThinkGeek, Inc. 128, 136
 three-fold law 9
 titanic prime 140, **264**
 Tolkien 15
 torus 14
 totient 74
 Tower of Hanoi 35
 Transamerica Pyramid 108
 tree 103, 170
 triadic prime 11, **264**
 triangular number **10**, 20, 36, 82,
 100, 152
 triangular peg solitaire 74
 truncatable prime 58, 85, 106,
 135, 144, 159, 182, 189, 195,
 201, 216, 224, 227, 232, **264**
 Turing (stamp) 219
 Turing machine 63, 219
 Twenty-nine Palms 34
 twin prime 11, 25, 30, 50, 53, 96,
 97, 102, 133, 140, 150, 151,
 156, 161, 166, 169, 174, 180,
 185, 198, 204, 206, 207, 209,
 210, 217, 241, **265**
 Twin Towers 117, 131
 Typhoid Mary 46

 UCLA 8, 241, 243, 245
 Ulam number 31, **31**, 69, 100
 Unabomber 70
 undecagon 19
 unholey prime 106, **265**
 unique prime 39, 148, **265**
 United States 16, 20, 29, 42, 46,
 48, 53, 71, 75, 77, 82, 98, 108,
 109, 120, 121, 125, 209, 240
 Universe number 56
 untouchable number **7**, 12
 ununtrium 65
 upside down 1, 20, 37, 47, 50, 99,
 102, 109, 132, 147, 150, 156,
 170, 176, 177, 194–196, 199,
 213, 236, **265**
 Uranus 15
 USS Prime 132
 Utah 66

 vampire number **74**
 Van Halen 130
 Vandiver's conjecture 178
 Vermont 81
 Vinogradov's theorem 9, **265**
 Virginia 20, 74, 92, 101, 118, 232

 Wagstaff prime 130, **265**
 Wall-Sun-Sun prime **265**
 Washington, D.C. 118, 158, 243
 Washington, George 120
 weakly prime 176, 189, **265**
 Wheeler 124, 236, 245
 Whitehead 90
 Wieferich prime 113, 132, **266**
 Wilson prime 12, 96, **97**, **266**
 Wilson's theorem **96**, 212
 Wisconsin 72
 Wolstenholme prime 155, 186,
 266

Woodall prime 90, 96, **266**

Yahtzee 20

Yarborough prime 17, **266**

YHWH 142

Zapruder slide set 88

Zavijava 126

zeta function 84, 203, 240, **266**

ZIP Code 98, 151, 158, 160, 169,
172