

Index

• Symbols and Numerics •

\approx (approximately equals symbol), 30
{ } (braces), 57. *See also* () (parentheses)
[] (brackets), 57. *See also* () (parentheses)
. (decimal point)
for money amounts less than one dollar, 141
moving to multiply or divide by powers of ten, 142
 \neq (doesn't equal symbol), 30
· (dot) for multiplication, 2, 7, 235
! (exclamation point) as factorial symbol, 283
> (greater than symbol), 30
< (less than symbol), 30
– (minus sign)
adjacent minus signs, 39, 42
for negative numbers, 37
outside absolute value bars, 39
() (parentheses)
in algebraic expressions, FOILing, 245–246
in algebraic expressions, removing, 244
answers to problems, 35, 61–67
in arithmetic expressions with powers, 56–57
in arithmetic expressions without powers, 54–55
associative property use with, 27–29
braces and brackets as forms of, 57
for math group operations, 27
nested, 57–58
order of operations for, 59
when subtracting negative numbers, 42
 \times (times sign), dot used instead of, 2, 7, 235
0
absolute value of, 39
leading, 8, 178
as placeholder, 8, 177
rules for powers containing, 32
trailing, 142, 148, 149–150, 154

1
as fraction denominator, 92
fractions equal to, 92
as neither prime nor composite, 73
rules for powers containing, 32
2
as base of binary numbers, 277–278
divisibility test for, 70
Fermat numbers based on powers of, 286
Mersenne numbers based on powers of, 286
powers of, 284, 286
10, powers of. *See* powers of ten
16, as base of hexadecimal number system, 278

• A •

absolute value, 39, 40
adding. *See also* arithmetic expressions
associative property, 27
in balance scale method for solving equations, 258
column lineup for, 14, 146
commutative property, 24
decimal numbers, 146
exponents to multiply identical variables, 244
fractions, 111–114
as inverse of subtracting, 23–24
mixed numbers, 120–123
with negative numbers, 40–41
number line for, 12, 13
order of operations for, 59
similar terms, 239
algebra. *See also* algebraic expressions
answers to problems, 248–254, 264–270
balance scale method for solving equations, 258
conventions in, 2, 7, 235
cross-multiplying fractions in equations, 261–262

algebra (*continued*)

- guessing and checking method for solving equations, 254, 255
- inspection method for solving equations, 255, 256
- rearranging equations to isolate x , 259–260
- rewriting equations, 254, 255
- simplifying expressions before solving equations, 256
- solving an equation, defined, 255
- variables, defined, 235
- algebraic expressions
 - adding similar terms, 239
 - algebraic terms in, 238
 - answers to problems, 248–254
 - arithmetic expressions versus, 236
 - combining similar terms, 242–243
 - constants, defined, 238
 - dividing similar terms, 240–241
 - evaluate, defined, 236
 - multiplying similar terms, 240–241
 - parentheses in, FOILing, 245–246
 - parentheses in, removing, 244
 - separating into terms, 237–238
 - simplifying, 242–247
 - subtracting similar terms, 239
 - terms, defined, 237
 - with value given for every variable, 236–237
- algebraic terms, 238. *See also* similar terms
- alternative forms of equations
 - answers to problems, 34–35
 - associative property for, 27–29
 - commutative property for, 24–26, 27–29
 - inverse operations for, 24–26
- amicable numbers, 285
- Ancient Greek numerals, 275
- approximately equals symbol (\approx), 30
- area of a shape
 - answers to problems, 217–220
 - circle, 210, 211
 - parallelogram, 206, 207
 - rectangle, 205–206, 207
 - rhombus, 206
 - square, 205, 207
 - trapezoid, 206–207

- triangle, 202, 203
- units of measurement for, 202
- arithmetic expressions
 - with addition and/or subtraction only, 49–50
- algebraic expressions versus, 236
- answers to problems, 60–67
- defined, 49
- evaluate, defined, 49
- mixed-operator, 52–53
- with multiplication and/or division only, 51–52
- with nested parentheses, 57–58
- order of operations for, 49, 59
- with parentheses and powers, 56–57
- with parentheses but no powers, 54–55
- with powers but no parentheses, 53–54
- associative property
 - of addition and multiplication, 27
 - answers to problems, 35
 - rearranging equations using, 27–29

• B •

- Babylonian numerals, 275
- balance scale method for solving equations, 258
- base of powers, 32
- base 2 (binary numbers), 277–278
- base 16 (hexadecimal numbers), 278
- binary numbers (base 2), 277–278
- boldfaced text in this book, 2
- borrowing in subtraction, 14, 124, 146
- box (rectangular solid), 212–213, 215
- braces ($\{ \}$), 57. *See also* parentheses $[()]$
- brackets ($[]$), 57. *See also* parentheses $[()]$
- bundled tally marks, 274

• C •

- carrying
 - in addition, 14, 120–121, 146
 - in multiplication, 15
- Cartesian graphs
 - answers to problems, 228–232
 - as Cartesian coordinate system, 221

Cartesian coordinates in, 221
 as Cartesian plane, 221
 defined, 221
 drawing lines on, 225–226
 function, defined, 225
 graph, defined, 221
 origin, defined, 221
 plotting points on, 221–223
 x-axis, defined, 221
 x-coordinate, defined, 221
 y-axis, defined, 221
 y-coordinate, defined, 221
 center of a circle, 210
 circle, 210–212
 circumference of a circle, 210, 211
 coefficient of algebraic term, 238
 column lineup
 for adding and subtracting decimals, 146
 for adding and subtracting whole numbers,
 14–15
 answers to problems, 21
 combining similar terms, 242–243
 common denominator of fractions
 adding fractions using, 111–112
 cross-multiplying to find, 100–101
 defined, 111
 subtracting fractions using, 115
 subtracting mixed numbers using, 123–126
 commutative property
 of addition and multiplication, 24
 answers to problems, 34–35
 rearranging equations using, 24–26
 comparing fractions, cross-multiplying for,
 100–101
 composite numbers
 answers to problems, 85
 defined, 73
 prime numbers versus, 73
 tests for, 73–75
 cone, 214, 215
 constants, 238
 continuous versus discrete units, 187
 converting
 decimals to fractions, 151–152
 decimals to percents, 165
 between English system of measurement, 188

 equivalent decimals and fractions (table),
 144–145
 fractions to decimals, 153–154
 fractions to percents, 167–168
 between improper fractions and mixed
 numbers, 94–96
 percents to decimals, 163–164
 percents to fractions, 166
 reasonability test for, 188
 standard notation to exponential
 notation, 178
 units of measurement between English and
 metric, 193–194
 cross-multiplying fractions
 in algebraic equations, 261–262
 answers to problems, 104–106, 269–270
 to find common denominator, 100–101
 to find the greater, 100–101
 when adding, 111–112
 when subtracting, 115
 cube, 212–213, 215
 cubic numbers, 283
 curious types of numbers
 amicable numbers, 285
 cubic numbers, 283
 factorial numbers, 283–284
 Fermat primes, 286
 Mersenne primes, 286
 perfect numbers, 284–285
 powers of two, 284, 286
 prime numbers, 73–75, 77, 285–286
 square numbers, 32, 281–282
 triangular numbers, 282
 cylinder, 213–214, 215



decimal number system, 177
 decimal numbers
 answers to problems, 155–162
 converting fractions to, 153–154
 converting percents to, 163–164
 converting to fractions, 151–152
 converting to percents, 165
 decimal point for, 141
 dividing by one another, 149–150

decimal numbers (*continued*)

equivalent decimals and fractions (table),
144–145

expanding as a sum, 141

fractions' similarity to, 141

Hindu-Arabic number system, 7–8

multiplying, 148

place value in, 141

repeating decimals, 141, 153–154

rounding, 142

terminating decimals, 141, 153–154

trailing zero in, 142

decimal point (.)

for money amounts less than one dollar, 141

moving to multiply or divide by powers of
ten, 142

decomposition

answers to problems, 86

defined, 77

factorization tree for, 77

for reducing fractions, 97

denominator of fractions

common, adding fractions using, 111–112

common, cross-multiplying for, 100–101

common, defined, 111

common, subtracting fractions using, 115

common, subtracting mixed numbers using,
123–124

defined, 91

fraction value if 1, 92

numerator equal to, 92

diameter of a circle, 210, 211

digits. *See also* numbers

answers to problems, 19–20

defined, 7

identifying, 8–9

rounding to, 10–11

discrete versus continuous units, 187

distance measurements

English system, 188

metric system, 190

dividend, defined, 149

dividing. *See also* arithmetic expressions

algebra conventions for, 235

in balance scale method for solving
equations, 258

decimals by one another, 149–150

decimals by powers of ten, 142

dividend, defined, 149

divisibility tests, 69–71

divisor, defined, 17, 149

fractions (multiplying by reciprocal),
109–111

as inverse of multiplying, 24

long, 17–18

mixed numbers, 118–120

with negative numbers, 43–44

number line for, 12, 13

order of operations for, 59

powers of ten by one another, 180

quotient, defined, 149

for reducing fractions, 97–98

remainder, avoiding when dividing deci-
mals, 149–150

remainder, defined, 17

with scientific notation, 183

similar terms, 240–241

divisibility. *See also* factors; multiples

answers to problems, 84

defined, 69

as prime number test, 73–74

tests for, 69–71

divisor, defined, 17, 149

doesn't equal symbol (\neq), 30

dot (\cdot) for multiplication, 2, 7, 235

drawing lines on Cartesian graphs, 225–226

• E •

Egyptian numerals, 274

English system of measurement

for area of a shape, 202

commonly used units (table), 188

converting between units, 188

converting to and from metric system,
193–194

reasonability test for conversions, 188

equations

alternative forms, 24–26, 27–29

associative property for rearranging, 27–29

balance scale method for solving, 258

commutative property for rearranging, 24–26
 cross-multiplying fractions, 261–262
 guessing and checking to solve, 255, 256
 inspection for solving, 255, 256
 inverse operations for rearranging, 24–26
 rearranging to isolate x , 259–260
 rewriting the problem, 255, 256
 simplifying expressions before solving, 256
 evaluate, defined, 49, 236
 Example icon, 4
 exclamation point (!) as factorial symbol, 283
 expanding a decimal as a sum, 141
 exponent of powers
 defined, 32
 multiplying identical variables, 244
 notation in algebra, 235
 powers of ten, 178, 180
 expressions. *See* algebraic expressions; arithmetic expressions

● F ●

factorial numbers, 283–284
 factorization tree, 77
 factors. *See also* divisibility
 of amicable numbers, 285
 answers to problems, 84–88
 in composite numbers, 73
 defined, 72
 finding all for a number, 75–76
 greatest common factor (GCF), 79–80
 multiples of, 72
 of perfect numbers, 284–285
 prime factors, 77–78
 in prime numbers, 73, 285
 feet
 converting to and from meters, 193
 converting to other English system units, 188
 Fermat numbers, 286
 Fermat, Pierre de (mathematician), 286
 Fermat primes, 286
 fill-in-the blank problems
 answers to problems, 34–35
 solving with alternative forms of equations, 24–26

fluid volume measurements
 English system, 188
 metric system, 190
 FOILING two sets of parentheses, 245–246
 fractions
 adding, 111–114
 answers to problems, 102–105, 127–140
 converting decimals to, 151–152
 converting percents to, 166
 converting to decimals, 153–154
 converting to percents, 167–168
 cross-multiplying, 100–101, 111–112, 115, 261–262
 decimals' similarity to, 141
 decomposition for reducing, 97
 denominator of, 91
 dividing (multiplying by reciprocal), 109–111
 equivalent decimals and fractions (table), 144–145
 improper, converting to and from mixed numbers, 94–96
 improper, defined, 91, 94
 increasing terms of, 97
 lowest terms for, 97
 mixed numbers, 94, 118–126
 multiplying, 107–109
 with numerator and denominator equal, 92
 numerator of, 91
 with 1 as denominator, 92
 proper, defined, 91, 94
 reciprocal, 92, 109–110
 reducing, 97–98, 107–108
 subtracting, 115–117
 functions, 225–226

● G ●

gallons
 converting to and from liters, 193
 converting to other English system units, 188
 GCF (greatest common factor), 79–80
 geometry
 answers to problems, 217–220
 box (rectangular solid), 212–213, 215

geometry (*continued*)

circle, 210–212
 cone, 214, 215
 cube, 212–213, 215
 cylinder, 213–214, 215
 defined, 201
 parallelogram, 206, 207
 perimeter, defined, 201
 prism, 213–214, 215
 pyramid, 214, 215
 quadrilaterals, 201, 205–209
 rectangle, 205–206, 207
 rhombus, 206
 shapes, defined, 201
 solids, defined, 201
 square, 205, 207
 trapezoid, 206–207
 triangles, 201, 202–204
 units of measurement for area, 202
 graph, 221. *See also* Cartesian graphs
 greater than symbol ($>$), 30
 greatest common factor (GCF), 79–80
 guessing and checking method for algebraic equations, 254, 255

• H •

heptagons, 201
 hexadecimal numbers (base 16), 278
 hexagons, 201
 Hindu-Arabic number system
 overview, 7–8
 powers of ten as basis of, 32, 177
 hundreds digit
 answers to problems, 19–20
 identifying, 8–9
 rounding to, 10–11
 hypotenuse of a right triangle, 202, 203

• I •

improper fractions. *See also* fractions
 converting to and from mixed numbers, 94–96
 defined, 91
 mixed numbers as alternative form, 94
 increasing terms of fractions, 97

inequalities, 30–31
 input of a function
 defined, 225
 input-output table, 225–226
 inspection method for algebraic equations, 255, 256
 inverse operations
 addition and subtraction, 23–24
 alternative forms of equations using, 24–26
 answers to problems, 34–35
 defined, 23
 multiplication and division, 24
 for rewriting algebraic equations, 254, 255
 squaring, 32
 italicized text in this book, 2

• K •

kilograms, converting to and from pounds, 193
 kilometers, converting to and from miles, 193

• L •

leading zeros
 counting for negative numbers, 178
 as unnecessary in whole numbers, 8
 least common multiple (LCM), 82–83
 legs of a right triangle, 202, 203
 less than symbol ($<$), 30
 liters, converting to and from gallons, 193
 long division, 17–18. *See also* dividing
 lowest terms for fractions, 97

• M •

mass, 190
 Mayan numerals, 276–277
 measurement. *See* units of measurement
 Mersenne, Marin (mathematician), 286
 Mersenne numbers, 286
 Mersenne primes, 286
 meters, converting to and from feet, 193
 metric system of measurement
 for area of a shape, 202
 basic units (table), 190

converting to and from English system,
 193–194
 prefixes (table), 191
 miles, converting to and from kilometers, 193
 minus sign (–)
 adjacent minus signs, 39, 42
 combining similar terms with, 242
 for negative numbers, 37
 outside absolute value bars, 39
 preceding parentheses, 244
 mixed numbers
 adding, 120–123
 converting to and from improper fractions,
 94–96
 defined, 94
 dividing, 118–120
 equivalent decimals and fractions (table),
 144–145
 improper fractions as alternative form, 94
 multiplying, 118–120
 subtracting, 123–126
 mixed-operator expressions, evaluating, 52–53
 multiples. *See also* factors
 answers to problems, 84–85, 87–88
 defined, 72
 generating for a number, 81
 least common multiple (LCM), 82–83
 multiplying. *See also* arithmetic expressions
 algebra conventions for, 2, 7, 235
 associative property, 27
 in balance scale method for solving equa-
 tions, 258
 commutative property, 24
 cross-multiplying fractions, 100–101,
 111–112, 115, 261–262
 decimals by powers of ten, 142
 decimals together, 148
 FOILING two sets of parentheses, 245–246
 fractions, 107–109
 identical variables, 244
 as inverse of dividing, 24
 in long division cycle, 17–18
 mixed numbers, 118–120
 by multiple digits, 15–16
 with negative numbers, 43–44
 number line for, 12, 13
 order of operations for, 59

powers of ten together, 180
 by reciprocal for fraction division, 109–110
 with scientific notation, 182, 183
 similar terms, 240–241
 symbols for, 2, 7

• *N* •

negating a number, 39–40
 negative numbers
 addition with, 40–41
 answers to problems, 45–47
 defined, 37
 division with, 43–44
 multiplication with, 43–44
 negating a number, 39–40
 number line for, 37–38
 powers of ten with, 178
 as subtraction result, 37–38
 subtraction with, 42
 nested parentheses, 57–58
 nonpolygons, 202
 number line
 answers to problems, 20–21, 45
 for big four, 12–13
 for negative numbers, 37–38, 41, 42
 numbers. *See also* curious types of numbers;
 negative numbers; numeral and number
 systems
 absolute value of, 39
 answers to problems, 19–22
 column lineup, 14–15
 constants as, 238
 digits, defined, 7
 identifying digits, 8–9
 large, long division for, 17–18
 large, multiplying, 15–16
 large, rounding for easier work with, 37–38
 large, subtracting from small numbers,
 37–38
 leading zeros, 8, 178
 number line, 12–13, 37–38, 41
 numerals, defined, 7
 numerals versus, 273
 place value in, 7–8, 141
 placeholders, zeros as, 8, 177
 rounding, 10–11

numeral and number systems

- Ancient Greek numerals, 275
- Babylonian numerals, 275
- base 2 (binary numbers), 277–278
- base 16 (hexadecimal numbers), 278
- bundled tally marks, 274
- Egyptian numerals, 274
- Hindu-Arabic number system, 7–8, 32, 177
- Mayan numerals, 276–277
- numerals versus numbers, 273
- prime-based numbers, 279–280
- Roman numerals, 276
- tally marks, 273

numerals. *See also* numbers; numeral and number systems

defined, 7

numbers versus, 273

numerator of fractions, 91, 92

● 0 ●

octagons, 201

one (1)

as fraction denominator, 92

fractions equal to, 92

as neither prime nor composite, 73

rules for powers containing, 32

ones digit, identifying, 8–9

order of operations, 49, 59

origin of Cartesian graphs, 221

output of a function

defined, 225

input-output table, 225–226

● p ●

parallelogram, 206, 207

parentheses [()]

in algebraic expressions, FOILing, 245–246

in algebraic expressions, removing, 244

answers to problems, 35, 61–67

in arithmetic expressions with powers, 56–57

in arithmetic expressions without powers, 54–55

associative property use with, 27–29

braces and brackets as forms of, 57

for math group operations, 27

nested, 57–58

order of operations for, 59

when subtracting negative numbers, 42

pentagons, 201

Percent Circle, 169–170

percents

answers to problems, 172–174

converting decimals to, 165

converting fractions to, 167–168

converting to decimals, 163–164

converting to fractions, 166

Percent Circle for calculating, 169–170

percent, defined, 163

perfect numbers, 284–285

perimeter of a shape

circle circumference, 210, 211

defined, 201

rectangle, 205–206, 207

square, 205, 207

place value

in decimal numbers, 141

in whole numbers, 7–8

placeholders

scientific notation for, 177

zeros as, 8, 177

plotting points on Cartesian graphs, 221–223

plus sign (+)

combining similar terms with, 242

preceding parentheses, 244

polygons

answers to problems, 217–219

classification by number of sides (table), 201

defined, 201

parallelogram, 206, 207

quadrilaterals, 201, 205–209

rectangle, 205–206, 207

rhombus, 206

square, 205, 207

trapezoid, 206–207

triangles, 201, 202–204

- pounds
 converting to and from kilograms, 193
 converting to other English system units, 188
- powers. *See also* powers of ten
 algebra conventions for, 235
 answers to problems, 36
 in arithmetic expressions with parentheses, 56–57
 in arithmetic expressions without parentheses, 53–54
 base of, 32
 containing 0 or 1, rules for finding, 32
 defined, 32
 exponent of, 32
 Fermat numbers based on, 286
 Mersenne numbers based on, 286
 order of operations for, 59
 square numbers, 32, 281–282
 of two, 284, 286
- powers of ten
 calculating, for positive whole numbers, 32
 defined, 32, 177
 dividing by one another, 180
 dividing decimals by, 142
 exponential notation for, 178
 Hindu-Arabic number system based on, 32, 177
 identifying, 178
 multiplying decimals by, 142
 multiplying together, 180
 negative numbers with, 178
 standard notation for, 178
- prefixes in metric system (table), 191
- prime factors, 77–78
- prime numbers
 answers to problems, 85
 composite numbers versus, 73
 defined, 73, 285
 Fermat, 286
 Mersenne, 286
 as prime factors, 77
 tests for, 73–75
- prime-based numbers, 279–280
- prism, 213–214, 215
- proper fractions. *See also* fractions
 defined, 91
 multiplying, 107
- pyramid, 214, 215
- Pythagorean theorem, 202–203
- **Q** •
- quadrilaterals
 answers to problems, 218–219
 defined, 205
 number of sides, 201
 parallelogram, 206, 207
 rectangle, 205–206, 207
 rhombus, 206
 square, 205, 207
 trapezoid, 206–207
- quotient, defined, 149
- **R** •
- radius of a circle, 210
- rate measurement (English system), 188
- rearranging equations to isolate x , 259–260
- reasonability test for conversions between English system units, 188
- reciprocal of a fraction
 defined, 92
 for fraction division, 109–110
- rectangle, 205–206, 207
- rectangular solid (box), 212–213, 215
- reducing fractions
 decomposition for, 97
 dividing for, 97–98
 when multiplying, 107–108
- remainder
 avoiding when dividing decimals, 149–150
 defined, 17
- Remember icon, 4
- removing parentheses in algebraic expressions, 244
- repeating decimals
 converting fractions to, 153–154
 defined, 141
- rewriting algebraic equations, 254, 255

rhombus, 206
 right triangles, 202–203
 Roman numerals, 276
 rounding numbers
 answers to problems, 19–20, 155
 to avoid remainder when dividing decimals, 149–150
 decimals, 142
 overview and practice, 10–11

• S •

scientific notation
 answers to problems, 184–186
 described, 177, 181
 multiplying and dividing with, 182–183
 writing numbers in, 181
 shapes. *See also* area of a shape; perimeter of a shape
 circle, 210–212
 cone, 214, 215
 defined, 201
 measurements for area of, 202
 nonpolygons, 202
 parallelogram, 206, 207
 polygons, 201
 quadrilaterals, 201, 205–209
 rectangle, 205–206, 207
 rhombus, 206
 square, 205, 207
 trapezoid, 206–207
 triangles, 201, 202–204
 sign of numbers. *See also* negative numbers
 affect of absolute value on, 39
 affect of negation on, 39
 affect on multiplication and division results, 43
 preceding parentheses, 244
 when combining similar terms, 242
 similar terms
 adding and subtracting, 239
 combining, 242–243
 defined, 238
 multiplying and dividing, 240–241

simplifying algebraic equations
 balance scale method, 258
 cross-multiplying fractions, 261–262
 rearranging to isolate x , 259–260
 rewriting the problem, 255, 256
 simplifying algebraic expressions
 combining similar terms, 242–243
 FOILing two sets of parentheses, 245–246
 removing parentheses, 244
 before solving equations, 256
 sixteen (16), as base of hexadecimal number system, 278
 solids. *See also* volume of a solid
 box (rectangular solid), 212–213, 215
 cone, 214, 215
 cube, 212–213, 215
 cylinder, 213–214, 215
 defined, 201
 prism, 213–214, 215
 pyramid, 214, 215
 solving algebraic equations
 answers to problems, 264–270
 balance scale method, 258
 cross-multiplying fractions, 261–262
 defined, 255
 by guessing and checking, 255, 256
 by inspection, 255, 256
 rearranging equations to isolate x , 259–260
 by rewriting the problem, 255, 256
 simplifying expressions first, 256
 speed measurement (English system), 188
 square, 205, 207
 square numbers, 32, 281–282
 square root, 32
 subtracting. *See also* arithmetic expressions
 in balance scale method for solving equations, 258
 borrowing, 14, 124
 column lineup for, 14, 15, 146
 decimal numbers, 146
 fractions, 115–117
 as inverse of adding, 23–24

large number from small number, 37–38
 in long division cycle, 17–18
 mixed numbers, 123–126
 with negative numbers, 42
 number line for, 12–13
 order of operations for, 59
 similar terms, 239

• T •

tally marks, 273–274
 temperature measurements
 English system, 188
 metric system, 190
 ten, powers of. *See* powers of ten
 tens digit
 answers to problems, 19–20
 identifying, 8–9
 rounding to, 10–11
 terminating decimals
 converting fractions to, 153–154
 defined, 141
 terms. *See also* similar terms
 algebraic, 238
 constants, 238
 defined, 237
 thousands digit
 answers to problems, 19–20
 identifying, 8–9
 rounding to, 10–11
 time measurements
 English system, 188
 metric system, 190
 times sign (\times), dot used instead of,
 2, 7, 235
 Tip icon, 4
 trailing zeros
 for converting fraction to exact decimal
 value, 154
 counting when multiplying decimals, 148
 defined, 142
 for dividing decimals, 149–150
 trapezoid, 206–207

triangles
 answers to problems, 217–218
 area, 202, 203
 defined, 201, 202
 Pythagorean theorem, 202–203
 right, 202–203
 triangular numbers, 282
 trigonometry, 202
 two (2)
 as base of binary numbers, 277–278
 divisibility test for, 70
 Fermat numbers based on powers of, 286
 Mersenne numbers based on powers
 of, 286
 powers of, 284, 286

• U •

units of measurement
 answers to problems, 195–199
 for area of a shape, 202
 continuous versus discrete units, 187
 converting between English and metric,
 193–194
 English system, 187–190
 metric system, 190–192
 need for, 187

• V •

variables
 in algebraic terms, 238
 conventions in this book for, 2
 defined, 235
 identical, multiplying, 244
 volume, fluid, 188, 190
 volume of a solid
 answers to problems, 220
 box (rectangular solid), 212–213, 215
 cone, 214, 215
 cube, 212–213, 215
 cylinder, 213–214, 215
 prism, 213–214, 215
 pyramid, 214, 215

• W •

Warning! icon, 4

weight measurements

English system, 188

metric system (mass), 190

• X •

x-axis, 221

x-coordinate, 221

• Y •

y-axis, 221

y-coordinate, 221

• Z •

zero

absolute value of, 39

leading, 8, 178

as placeholder, 8, 177

rules for powers containing, 32

trailing, 142, 148, 149–150, 154