

A

Absolute Value

defined, 682
 equations, 689-690, 695-697
 and the number line, 684, 689

Addition

of integers (negatives), 58-60
 of like terms, 316
 of rational expressions, 249-250
 undoing, 14-15
 of x 's, 125-126

Algebra

defined, 6
 notation, 27-29
 steps for solving real-world problem with, 10

Applications

absolute value, 682
 age problems, 142-143
 atoms, 54
 banking, 38-39
 breakeven sales level, 427
 building a pool deck, 408-410
 calculating profits, 426-427
 checking accounts, 54
 distance problems with algebra, 161-163, 191-193
 factory manufacturing, 138
 functions used, 416-417
 Galileo (and equations), 431-434
 getting bigger/getting smaller problems, 137
 heating bills, 143
 interest, 38-39
 Kepler (and Third Law), 437-439
 mass of the earth, 450
 mirrors and headlights, 506-507
 mixture problems, 195-197, 199-200
 percent problems with algebra, 33-35
 protons and electrons, 54-55

purpose of negatives, 55
 statistics and probability, 716, 740
 stock market, 55
 temperature, 55, 63-64, 628-629
 wheat prices, 139

Approximately equal to,

431-432

Area

of a square, 303
 of a triangle, 443
 with x 's, 408-410

Arithmetic, 6

Associative Property

of addition, 113
 of multiplication, 118

B

Banking, 38-39

Binomials

defined, 344
 multiplying (see Distributing)

Box and whisker plot, 724-725

Brackets and braces, 166

C

Calculator

estimating irrationals with, 364
 and graphing, 766-769

Canceling

in fractions, 213-214, 216
 x 's, 221
 quantities in parentheses, 224-225

Change Sides, Change Signs, 203-204

Coefficients

of 1, 133
 of -1 , 133
 adding and subtracting, 125-126
 defined, 125
 fraction and decimal, 126
 negative, 126

Combining x 's, 124-126

Commutative Property

of Addition 23-24
 of Multiplication 23-24

Completing the square, 403-404

Coordinate plane, 515-516

Coordinates, 515

Cube

as power, 303
 in volume, 303

Cube root (third root), 350, 355

D

Data, 716

Denominator

common denominator, 126, 284
 defined, 212
 lowest common denominator, 289-290, 294-295

Dependent events, 751

Difference of two squares, 484

Dispersion, 723

Distance

algebra word problems, 416-418, 432-433
 how to calculate, 191

Distributing

defined, 149
 factoring with (see Reverse distributing)
 and freeing x from parentheses, 149-150
 multiplying by, 153
 and negatives, 153-154, 157-158
 and simplifying expressions, 150
 and several variables, 464-466

Distributive property (see Distributing)

Dividend, 170

Division

of integers (negatives), 69-70
 of powers, 330-331

Divisor, 170

Domain, 704

Dot (\cdot)

as multiplication symbol, 27

E

Equations

change sides, change signs in, 203
 checking solution of, 263, 456
 combining like terms in, 316
 defined, 9
 distributing in, 149
 false, 207
 graphing, 516, 520-522, 527-529, 535-537
 higher-degree, 527-529
 for horizontal line, 555-556
 as identities, 207-208
 linear, 522
 Newton (and equation), 449
 rational, 262-263
 with several variables, 443-444, 500-502
 simplifying, 114-115
 slope-intercept form of, 563
 translating words into, 10
 two-variable, 418
 undoing addition, 14-15
 undoing a power, 355
 undoing division, 20
 undoing multiplication, 19
 undoing in reverse order, 100-101
 undoing subtraction, 16
 for vertical line, 556-557
 with x 's on both sides, 182-184

Equivalent equations, 11

Equivalent expressions, 24

Equivalent fractions,
 Law of 212-213

Exponents

defined, 302
 of 1, 320
 of 0, 331
 negative, 331, 335, 338-339

Expression

defined, 9
 factoring, 330-331, 388, 392, 396, 469, 474
 evaluating, 417-418

rewriting, 24
 simplifying, 114-115, 118-120, 124

F

Factor

greatest common factor (GCF), 233
 of a number, 213
 by reverse distributing, 228-229, 233-235, 395-396

Factoring

and canceling, 213-214
 defined, 213
 into prime numbers, 216

False Equations, 207

First-degree equations, 376

Fourth-degree equations,
 376

Fractions

denominator of, 212
 law of equivalent, 212-213
 lowest common denominator (LCD)
 of (See Lowest common denominator (LCD))
 and negatives, 76-77
 numerator of, 212
 reciprocal of, 170
 reducing, 213-214

Fraction bar

as division symbol, 27
 and order of operations, 94

Fractional coefficients, 126

Freeing x from a fraction,
 170-171, 175-176

Freeing x from parentheses
 (See Distributing)

Function

defined, 418
 domain of, 704-705
 graphing, 520-522
 linear, 522
 nonlinear, 527-529
 range of, 705
 vertical line test, 703

Functional notation, 710-711

Fundamental counting principle, 748

G

General equations, 758

Golden rule of algebra, 15

Graph

of equation, 514-516, 520-522, 527-529, 535-537
 of function, 520-522, 527-529, 535-537, 555-557
 histogram, 732-733
 of inequality, 664-667
 Stem and leaf plot, 733-734

Grouping symbols (see Brackets and braces)

H

Histogram, 732-733

Horizontal Line

equation of, 555-556
 graphing, 555
 slope of, 555

Hypotenuse (of right triangle), 368

I

Identities, 208

Independent events, 751

Inequalities

algebraic (with x 's), 616
 compound, 651-653
 graphing, 616, 651-653, 664-667
 symbols, 616
 systems of two-variable, 672-679
 two-variable, 657-659, 664-667
 undoing, 622-624, 628-629

Integers

addition of, 58-60
 defined, 51
 division of, 69-70
 multiplication of, 66-67
 negative, 50
 positive, 50
 subtraction of, 62-64

Interest, 38-39, 137-139

Inverse operations

addition-subtraction as, 14-16
 defined, 17

multiplication-division
as, 19-20
powers-roots as, 350-352

Inverting and multiplying,
170

Irrational numbers
adding and subtracting,
642-643
defined, 359
dividing, 638
estimating, 363-364
multiplying, 634-635
simplifying, 647-648

L

Law of equivalent fractions,
212-213

Least common multiple,
289

Leg (of a right triangle),
368

Like terms
combining, 316
defined, 316
with several variables,
456

Line
horizontal, 555-556
slope of, 544-546
vertical, 556-557

Linear equation, 522

**Lowest common
denominator (LCD)**,
289-290, 294-295

M

Mean, 716

Median, 717

Missing number (see
Unknown)

Mode, 718

Monomials
adding (see Like terms)
defined, 344
multiplying (see
Distributing)

Moving x 's, 182-184, 187-
188

Multiplication
associative property of,
118
commutative property of,
23

of integers (negatives),
66-67
of polynomials, 325-327
of rational expressions,
488
symbols (in algebra), 27

**Multiplication Principle of
Probability**, 750-751

N

Negative numbers
addition with, 58-60
coefficients and, 126
defined, 50
division with, 69-70
exponents and, 331
fractions and, 59-60
multiplication with, 66-
67
negative signs and, 50
and parentheses, 62-63
purpose of, 54-55
subtraction with, 62-64

Number line
defined, 50
and inequalities, 616-617

Numerator, 212

O

One-variable equations, 418

Operations
addition, 6
defined, 6
division, 6
multiplication, 6
powers, 302
roots, 350
subtraction, 6
undoing, 14-16

Opposites, 51

Ordered pairs, 516

Order of operations
defined, 85
rules, 85
rules including powers,
311
rules including roots,
351
writing equations using,
89-90, 94-96

Origin, 515

Outliers, 717

P

Parabola, 528, 529

Parallel lines, 607-608

Parentheses
as multiplication symbol,
27
and order of operations,
89-90
within parentheses (see
Brackets and braces)

Percent

algebra word problems
with, 34-35
converted into a decimal,
33
converted into a fraction,
33
defined, 33

Perfect cube, 647-648

Perfect square, 647-648

Plane, 515

Points
finding slope with, 550-
551, 555-556
plotting, 514-515, 520
writing equation with,
570-571

Point-slope form, 570-571

Polynomials
adding, 456
defined, 344
factoring (see Reverse
distributing)
multiplying (see
Distributing)
subtracting, 456

Population, 719

Positive Numbers
defined, 50
positive signs and, 50

Powers

base of, 302
defined, 302
dividing, 330-331
exponent of, 302
multiplying, 320-321
and negative signs, 312
and order of operations,
312
to a power, 321

Prime factors, 217

Prime numbers, 216

Probability

- defined, 740
- experimental, 753
- theoretical, 753

Product, 23

Profit, 55, 108-109, 426-427

Proportion, 273

Purpose of algebra, 9-11

Pythagorean Theorem

- defined, 368

Q

Quadrants, 516

Quadratic (second-degree)

equations

- defined, 376
- irrational solutions of, 377-378
- solving by completing the square, 403-405, 409-410
- solving by factoring, 388-389, 392, 395-396, 399
- solving with the quadratic formula, 760-761

Quadratic formula, 760-761

Quartile, 724

Quotient, 113-114

R

Radical (see Roots)

- defined, 350
- sign, 350

Raising a number to a

power (see Powers)

Range

- of function, 705
- of set of data, 723

Rate of change (see Slope)

Ratio, 273

Rational equations

- clearing fractions in, 263, 268, 279-280, 284-285, 290, 294-296
- checking the solution of, 263
- defined, 262

Rational expressions

- adding, 249-250
- adding and subtracting in several variables, 494-496
- canceling x 's, 221

defined, 220

dividing, 244, 343-344

multiplying, 239-240, 343-344

multiplying and dividing

in several variables, 488-489

and parentheses, 224-225

reducing, 220-221, 338-339

reducing in several variables, 469-470, 474, 478-479, 483-484

subtracting, 255

Rational numbers, 360

Real numbers, 360

Reciprocal, 170

Reducing fractions

- by dividing, 213
- by factoring and canceling, 213-214

Relation, 418

Reverse distributing

advanced form of, 395, 474, 478-479

defined, 228-229, 233-235

with several variables, 474, 478-479

Rewriting an expression, 24

Right triangle

- defined, 368
- legs of, 368
- hypotenuse of, 368

Rise over run (see Slope)

Roots

adding and subtracting, 642-643

cube, 350

defined, 350

dividing, 638

irrational, 360

multiplying, 634-635

and order of operations, 351

simplifying, 647-648

square, 350

S

Sample, 718

Scientific notation, 307

Second-degree equations

(see Quadratic equations)

Simplifying, 114-115

Slope

defined, 546

fractional, 551

positive, 544, 550

negative, 550

Slope-intercept form, 563

Solution, 10

Solution pairs, 421-422

Solution triples, 443

Speed, 42-43

Square

as power, 302

area of, 303

Square root, 350-351

Statistics, 716

Stem and leaf plot, 733-734

Substituting a number for

x , 15, 79-80

Subtraction

by adding the opposite, 62

of integers (negatives), 62-63

of like terms, 585

of rational expressions (see Rational expressions)

undoing (see Undoing)

of x 's, 126

Sum, 23

Systems of equations

defined, 578

dependent (infinite solutions), 608-609

inconsistent (no solutions), 607-608

solving by addition, 578-579

solving by graphing, 600-601

solving by rewriting first, 589-590

solving by substitution, 594-596

solving by subtraction, 584-585

T

Taking a root (see Roots)

Terms

combining, 316

defined, 114

like (see Like terms)

Third-degree equations,

376

Third power (see Cube)

Third root (see Cube root)

Tree diagram 743, 748

Trinomial

adding (see Combining like terms)

defined, 344

dividing (see Rational Expressions)

multiplying (see Distributing)

Two-variable equations

defined, 418

solving for one variable in terms of another, 421-422

U

Undoing

addition and subtraction

in equations, 14-16

equations with negatives, 72-74

inequalities, 622-624, 628-629

multiplication and division in equations, 19-20

powers and roots in equations, 355-356

quadratic equations, 382-384

Undoing in reverse order

equations, 100-101, 104-105, 108-110

inequalities, 628-629

quadratic equations, 382-384

Unit conversion, 43

Unknown

defined, 43, 90

problems with two, 142-143

V

Variable

defined, 418

dependent, 704

independent, 703

Vertical line

equation of, 557

graphing, 557

slope of, 556

Vertical line test, 703

Volume

of box, 303

W

Weight, 433

X

x , 7

x as prime number, 220

x -axis, 514

x -coordinate, 515

x -intercept, 535

x 's on both sides equations, 182-184

x -terms, 137, 139, 142, 143

$-x$ 79-80, 133-134

Y

y , 7

y -axis, 514

y -coordinate, 515

y -intercept, 535

Z

Zero

dividing by, 70

exponent, 331

fractions and, 70

as integer, 51

multiplying by, 67

opposites and, 51