

Key Vocabulary Index

Mathematical terms are best understood when you see them used and defined *in context*.

This index lists where you will find key vocabulary. A full glossary is available in your

Record and Practice Journal and at *BigIdeasMath.com*.

- absolute value, 4
additive inverse, 10
adjacent angles, AT3
angle of rotation, 234
base, 556
center, 261A
center of rotation, 234
circle, 261A
circle graph, 364
circumference, 261B
complementary angles, 466, AT2
composite solid, 284
concave polygon, 480
congruent angles, 467
congruent figures, AT12
congruent sides, 472
conversion factor, AT8
convex polygon, 480
coordinate plane, 36
corresponding angles, 196
corresponding sides, 196
cross products, 113
cube root, 537A
dependent events, 406
diameter, 261A
dilation, AT15
direct variation, 138
discount, 174
equiangular triangle, 472
equilateral triangle, 472
equivalent equations, 72
event, 386
experiment, 386
experimental probability, 400
exponent, 556
exterior angles, 495
fair experiment, 393
histogram, 356
hypotenuse, 518
image, 222
independent events, 406
indirect measurement, 209, 489
integer, 4
interest, 180
interior angles, 495
inverse variation, 144
irrational numbers, 526
isosceles triangle, 472
lateral face, 252
leaf, 350
legs, 518
like terms, 81A
line of reflection, 228
linear function, 450
markup, 174
metric system, 132
net, 256
opposites, 10
origin, 36
outcomes, 386
percent, 160
percent of change, 166
percent of decrease, 166
percent of increase, 166
perfect cube, 537A
perfect square, 512
perpendicular lines, 494
pi, 261B
polygon, 478
polyhedron, 252
population, 370
power, 556
principal, 180
probability, 387
proportion, 112
proportional, 112
Pythagorean Theorem, 518
Pythagorean triple, 541
quadrant, 36
radical sign, 512
radicand, 512
radius, 261A
rate, 100
ratio, 100
rational number, 50, 52
real numbers, 526
reflection, 228, AT13
regular polygon, 479
regular pyramid, 272
repeating decimal, 52
rise, 444
rotation, 234, AT14
run, 444
sample, 370
scale, 214
scale drawing, 214
scale factor, 215
scale model, 214
scientific notation, 582
similar figures, 196
similar solids, 332
similar triangles, 489
simple interest, 178, 180
simplest form, 81A
slant height, 272, 278
slope, 106, 444
slope-intercept form, 450
square root, 512
stem, 350
stem-and-leaf plot, 350
supplementary angles, 466, AT2
surface area, 256
terminating decimal, 52
theorem, 516
theoretical probability, 392
three-dimensional figure, 252
transformation, 222
translation, 222, AT12
transversal, 494
unit rate, 100
U.S. customary system, 132
vertical angles, 467, AT3
volume, 300
x-axis, 36
y-axis, 36
y-intercept, 450

Student Index

This student-friendly index will help you find vocabulary, key ideas, and concepts. It is easily accessible and designed to be a reference for you whether you are looking for a definition, real-life application, or help with avoiding common errors.

A

Absolute value, 2–7

- comparing, 5
- defined, 4
- error analysis, 6
- finding, 4
- opposites, 10
- real-life application, 5

Addition

- Associative Property of, 67A
- Commutative Property of, 67A
- of integers, 8–13, 14–15
 - error analysis, 12
- Property of Equality, 72
- Property of Inequality, 87A
- of rational numbers, 56–61
- in scientific notation, 591A
- to solve equations, 70–75
- of square roots, 534

Additive inverse, defined, 10

- Additive Inverse Property, 10
 - real-life application, 67B

Adjacent angles, *See also* Angle(s)

- defined, AT3

Algebra

- area of a cylinder, 264
- cross products, 113
- equations
 - direct variation, 138–141
 - error analysis, 426
 - inverse variation, 142–147
 - percent, 158–163
 - simple interest, 178, 180–183
 - solving by addition, 70–75
 - solving by division, 76–81
 - solving by multiplication, 76–81
 - solving by subtraction, 70–75
 - solving multi-step, 422–427
 - solving two-step, 82–87
 - solving using tables and graphs, 434–439
 - with variables on both sides, 428–433, 433A–433B

formulas, *See* Formula(s)

- inequalities
 - solving, 87A–87D

integers, 13, 18

- powers and exponents, 562, 568, 576

- properties, *See* Properties
- surface area of a prism, 258
 - formula for, 258

Algebra tiles, 70–71, 76, 82–83

- Algebraic expression(s)
 - like terms, 81A
 - simplest form, 81A
 - simplifying, 81A–81B
 - real-life application, 81B

Angle(s)

- adjacent
 - defined, AT3
- alternate exterior, 496
- alternate interior, 496
- classifying, 464–469, AT2–AT3
 - error analysis, 468
- complementary, 464–469, AT2
 - defined, 464, 466, AT2

congruent

- defined, 467
 - error analysis, 497
 - project, 498
 - of a regular polygon, 479

corresponding, 196–199,

494–495

exterior

defined, 495

indirect measurement, 489

error analysis, 490

interior

defined, 495

measure, 467

of a polygon, 476–483

of a triangle, 470–475

pairs of, 464–469

of a polygon, 476–483

error analysis, 481, 482

real-life application, 479

of rotation, 234

supplementary, 464–469, AT2

defined, 422, 464, 466, AT2

symbol for, 196

of a triangle

classifying, 470–475

error analysis, 474

measures of, 473

project, 491

vertical

defined, 423, 467, AT3

Angle of rotation, defined, 234

Area

of a circle, 261B, 264

formula for, 261B

of a similar figure, 200–205, 209

of a triangle, 259

Associative Property

of Addition, 67A

of Multiplication, 67A

B

Base, defined, 556

of a cone, 278

of a cylinder, 262, 264

inverse variation with height, 142

of a prism, 256, 258–259

of a pyramid, 270

of a regular pyramid, 272

C

Center

of a circle

defined, 261A

of rotation

defined, 234

Circle(s)

area of, 261B, 264

formula for, 261B

real-life application, 513

center of, 261A

circumference of, 261B

defined, 261B

formula for, 261B

defined, 261A

formula for, 261A

pi, 261B

estimating, 261B

radius of, 261A

defined, 261A

formula for, 261A

Circle graph(s), 362–367

defined, 364

making, 363–364

reasoning, 367

Circumference, 261B

of a circle, 261B

formula for, 261B

defined, 261B

Coefficient, 81A

Common errors

inequalities, 87C

linear functions, 450

- percent equation, 160
 powers
 dividing, 568
 rotations, 235
 similar figures, 197
 y -intercept, 450
Communication, *Throughout. For example, see:*
 Reading
 congruent angles
 symbol for, 467
 congruent sides
 symbol for, 472
 polygons, 478
 scientific notation, 580–585
 square roots
 simplifying, 534
 Writing
 angles
 congruent, 498
 vertical, 468
 exponents
 negative, 578
 intersecting lines, 468
 Pythagorean Theorem, 542
 Quotient of Powers Property, 570
 scientific notation and
 standard form, 584, 590
 square roots
 adding, 536
 approximating, 529
 Product Property of Square Roots, 536
 Quotient Property of Square Roots, 536
 subtracting, 536
 Commutative Property of Addition, 67A
 of Multiplication, 67A
 Comparing
 absolute values, 5
 direct and inverse variation, 143
 numbers in scientific notation, 583
 populations, 373A–373B
 probabilities, 401
 real numbers, 527
 similar solids, 330–331
 units of measure, 131
 volumes, 310, 567, 575
 and surface areas, 330–331
Complementary angles, *See also Angle(s)*
 defined, 464, 466, AT2
Composite solids
 defined, 284
 open-ended, 286
 surface area of, 282–287
 volume of, 324–329
 formula for, 326
 real-life application, 327
Concave polygon(s), defined, 480
Concept circle, 440
Cone(s), 276–281
 defined, 252
 drawing, 276–277
 height of, 318
 similar, 332
 slant height, 278–279
 surface area of, 276–281
 formula for, 278
 real-life application, 279
 volume of, 316–321
 error analysis, 320
 formula for, 316, 318
 real-life application, 319
 reasoning, 320–321
 writing, 320
Congruent angle(s), *See also Angle(s)*
 defined, 467
Congruent figures, defined, AT12
Congruent side(s)
 defined, 472
 symbol for, 472
 Connections to math strands,
Throughout. For example, see:
 algebra, 27, 32, 61, 428, 434
 integers, 13, 19
 geometry, 38, 75, 87, 115, 169,
 199, 205, 274, 281, 433, 491,
 499, 537
 Constructing a triangle, AT4–AT6
 Conversion
 between metric and customary units, 130–135, AT8–AT9
 factor, AT8
Convex polygon(s), defined, 477, 480
Coordinate plane(s), 34–39
 defined, 36
 error analysis, 38
 graphing, 34–35, 105–109,
 137–140
 ordered pairs, 34–39
 origin, 36
 quadrants, 36
 real-life application, 37
 reflections in, 229–231
 rotations in, 235–237
 translations in, 223–225
 x -axis, 36
 y -axis, 36
Corresponding angles, 196–199,
 494–495
 defined, 196
Corresponding sides, 196–199
 defined, 196
 used to find measurements, 210
Cross product(s)
 defined, 113
 Cross Products Property, 113
 to solve proportions, 124–126
Cube
 volume of, 537B
Cube root
 defined, 537A
 perfect cube, 537A
 symbol, 537A
Customary unit(s)
 comparing, 131
 converting, 130–135
 error analysis, 134
 history of, 130
Cylinder(s)
 defined, 252
 similar, 332
 surface area of, 262–267
 error analysis, 267
 real-life application, 265
 volume of, 304–309
 formula for, 306
 real-life application, 307
 reasoning, 321

D

- Data**
 analyzing
 circle graphs, 362–367
 histograms, 354–359
 samples and populations, 368–373
 stem-and-leaf plots, 348–353
circle graphs
 analyzing, 362–367
 reasoning, 367
displaying
 in a circle graph, 362–363
histograms
 analyzing, 354–359
 organizing, 348–349, 350
 research, 349, 353
samples and populations
 analyzing, 368–373
 error analysis, 372
stem-and-leaf plots
 error analysis, 352
 research, 353
Decimal(s)
 as fractions, 53

- as rational numbers, 52
rational numbers as
error analysis, 54
repeating, 526
defined, 52
terminating, 526
defined, 52
- Dependent events**, 404–411
defined, 406
- Diameter**, 261A, 279
of a circle, 261A, 279
defined, 261A
formula for, 261A, 279
- Dilation**, defined, AT15
- Direct variation**, 136–141
defined, 138
error analysis, 140
identifying, 138
and inverse variation, 143–144
modeling, 139
research, 141
- Discounts**, 172–177
defined, 174
- Distributive Property**
to solve equations, 424, 430
- Division**
of fractions, 66
of integers, 28–33
error analysis, 32
modeling, 31
reading, 32
real-life application, 31
- Property of Equality**, 78
- Property of Inequality**, 87B–87C
- Quotient of Powers Property**,
566–571
in scientific notation, 591B
real-life application, 591B
to solve equations, 76–81
- Drawing**
a cone, 276–277
a graph, 137
a net, 270
a prism, 252
a pyramid, 253
scale, 212–217, 217A–217B
similar figures, 206
a solid, 251
views of, 253
three-dimensional figures,
250–255
- E**
- Equality**
Addition Property of, 72
Division Property of, 78
- Multiplication Property of, 78
Subtraction Property of, 72
- Equation(s)**
equivalent
defined, 72
graphing, 428, 434–439, 448–453
modeling, 70–71, 76, 82–83
multi-step, 422–427
error analysis, 426
real-life application, 425
percent, 158–163
error analysis, 162
real-life application, 161
reasoning, 162–163
- proportion**, 110, 112
solving
by addition, 70–75
by combining like terms, 424
by division, 76–81
error analysis, 74, 80, 86
by multiplication, 76–81
real-life applications, 73, 79,
425, 431, 437
reasoning, 87
by subtraction, 70–75
two-step, 86
using Distributive Property,
424, 430
using reciprocals, 79
using tables and graphs,
434–439
with variables on both sides,
428–433, 433A–433B
- two-step**
error analysis, 86
modeling, 82–83
real-life application, 85
solving, 82–87
writing, 87
- with variables on both sides,
428–433, 433A–433B
error analysis, 432
real-life application, 431
writing, 87
- Equiangular triangle(s)**, defined,
472
- Equilateral triangle(s)**, defined,
472
- Equivalent equations**, defined, 72
Error analysis, *Throughout. For example, see:*
algebra, 74, 80
angles
classifying, 468, 497
sum of the measures of, 481
converting units of measure, 134
coordinate planes, 38
- direct variation, 140
division
of integers, 32
equations
multi-step, 426
percent, 162
solving, 74, 80, 86
two-step, 86
with variables on both sides,
432
- expressions**
evaluating, 514, 558, 578
simplifying, 564
- integers**
absolute value of, 6
adding, 12
dividing, 32
multiplying, 26
subtracting, 18
- interest, simple, 182
- inverse variation, 146
- irrational numbers, 529
- linear functions, 452
- lines
parallel, 497
- percents, 162
of change, 168
of decrease, 168
- polygons**
sum of the angles measures
of, 481, 482
- prisms**
volume of, 302
- probability**, 388
outcomes, 402
- Product of Powers Property**, 564,
578
- proportions**, 120, 126
- Pythagorean Theorem**, 520
- Quotient of Powers Property**,
570, 578
- rational numbers**
as decimals, 54
dividing, 66
multiplying, 66
subtracting, 60
- samples and populations**, 372
- scientific notation**, 584
reading, 584
writing, 590
- similar solids**, 336
- slope, 108, 447
- square roots**
approximating, 529
finding, 514
simplifying, 536
- stem-and-leaf plots**, 352

surface area of a cylinder, 267
 triangles
 classifying, 474
 indirect measurement, 484
 right, 520
 similar, 490
 volume
 of a cone, 320
 of a prism, 302
 of similar solids, 336
Estimating a square root, 527
Event(s), *See also Probability*
 defined, 386
 dependent, 404–411
 defined, 406
 independent, 404–411
 defined, 406
Example and non-example chart, 484
Experiment(s), *See also Probability*
 defined, 386
Experimental probability, *See also Probability*
 defined, 400
Exponent(s), 554–559
 defined, 556
 error analysis, 558
 negative, 574–579, 582
 defined, 576
 error analysis, 578
 real-life application, 577
 powers and, 554–559, 560–565,
 566–571
Product of Powers Property,
 560–565
Quotient of Powers Property,
 566–571
 real-life application, 557
 scientific notation
 defined, 582
 error analysis, 584, 590
 writing, 586–591
 scientific notation and
 reading, 580–585
 real-life application, 583
 writing, 586–591
 using, 25
 zero, 574–579
 defined, 576
Expression(s)
 algebraic
 like terms, 81A
 real-life application, 81B
 simplest form, 81A
 simplifying, 81A–81B
 approximating, 528
 equivalent
 defined, 72

error analysis, 26
 evaluating, 31, 512, 556, 576
 error analysis, 514, 558, 578
 simplifying, 81A–81B, 568–569,
 577
 error analysis, 564
 real-life application, 81B
 writing
 using exponents, 556
Exterior angles(s), defined, 495

F

Fair experiment, defined, 393
Financial literacy, 57, 179
Formula(s)
 area
 of a circle, 261B, 264
 of a lateral surface, 265
 of a triangle, 259
 circumference, 261B
 diameter, 261A, 279
 interest, simple, 178
 period of a pendulum, 511
 pi, 261B
 Pythagorean Theorem, 518
 radius, 261A
 real-life application, 513
 surface area
 of a square prism, 285
 of a square pyramid, 285
 for surface area of
 a cone, 279
 a cylinder, 264
 a rectangular prism, 258
 a regular pyramid, 272
 volume
 of a composite solid, 326
 of a cone, 316, 318
 of a cube, 537B
 of a cylinder, 306
 of a prism, 298–299
 of a pyramid, 312
 of a rectangular prism, 535
 of a sphere, 557, AT16
 of a square prism, 326
 of a square pyramid, 326
Formula triangle, 322
Four square, 268
Fraction(s)
 adding, 56–61
 decimals as, 53
 dividing, 62–67
 multiplying, 62–67
 subtracting, 56–61
Frequency table(s), 356
Function(s), *See also Linear function(s), Equation(s)*
 input-output tables and, 448

G

Geometry, AT4–AT7
angles
 alternate exterior, 495–496
 alternate interior, 495–496
 classifying, 464–469
 complementary, 464–469
 congruent, 467
 error analysis, 468
 supplementary, 464–469
 vertical, 467
constructing a triangle, AT4–AT6
describing the intersection of a plane and a solid, AT7
golden ratio, 532–533
parallel lines
 error analysis, 497
 project, 498
 and transversals, 492–499
perimeters, 542
polygons, *See also Polygons(s)*
 angles of, 476–483
 classifying, 476–483
 concave, 480
 convex, 477, 480
 defined, 478, 479, 480
 error analysis, 481, 482
 real-life application, 479
 regular, 479
Pythagorean Theorem, 516–521
 error analysis, 520
 real-life application, 540
 using, 538–543
right triangles, *See also Right triangle(s)*
 hypotenuse of, 518
 legs of, 518
 similar, AT18–AT19
triangles, *See also Triangle(s)*
 angle measure of, 470–475
 classifying, 470–475
 equiangular, 472
 equilateral, 472
 error analysis, 474, 490
 isosceles, 472
 project, 491
 similar, 486–491
Golden ratio, 532–533
 constructing, 532
 defined, 532
 and square roots, 532–533
Graph(s), 105
 circle, 362–367
 in a coordinate plane, 101,
 106–109, 137–140
 of direct variation, 137–140

drawing, 137
of equations, 428, 448–453
histograms, 354–359
linear, 442–447
 using slope-intercept form, 450–453
of proportional relationships, 141A–141B
of rates, 101
for solving equations, 434–439
 real-life application, 437
stem-and-leaf plots, 348–353

Graphic organizer(s)
concept circle, 440
example and non-example chart, 218, 484
formula triangle, 322
four square, 268
idea and examples chart, 20
information frame, 360
information wheel, 128, 572
process diagram, 68
summary triangle, 170, 522
word magnet, 396

H

Height
of a cone, 318
inverse variation with base, 142

Hemisphere, defined, AT17

Histogram(s), 354–359
defined, 356
making, 356
reasoning, 359

Hypotenuse
of a right triangle, 516–521
 defined, 516, 518
 error analysis, 520
 finding the length of, 518

I

Idea and examples chart, 20

Image, defined, 222

Independent events, 404–411
defined, 406

Indirect measurement, *See also Measurement(s)*
defined, 489
error analysis, 490
and parallel lines, 493
project, 493

Inequality
Addition Property of, 87A
Division Property of, 87B–87C
Multiplication Property of, 87B–87C

real-life application, 87D
solving, 87A–87D
Subtraction Property of, 87A
two-step, 87D

Information frame, 360
Information wheel, 128, 572
Input-output tables
 used for equations, 448

Integers, 4
absolute value of, 2–7
 error analysis, 6
 real-life application, 5

adding, 8–15
 error analysis, 12

additive inverse, defined, 10

dividing, 28–33
 error analysis, 32
 modeling, 31
 reading, 32
 real-life application, 31

examples of, 4

multiplying, 22–27
 error analysis, 26
 real-life application, 25

ordering, 5

reasoning, 7, 19

subtracting, 14–19
 error analysis, 18
 open-ended, 18
 real-life application, 17

Interest

defined, 180
simple, 178–183
 defined, 178, 180
 error analysis, 182
formula for, 178
modeling, 178
reasoning, 183

Interior angle(s), defined, 495

Intersecting line(s), 467
Intersection of a plane and a solid, AT7

Inverse operations, 72
 using to solve inequalities, 87A

Inverse variation, 142–147

defined, 144
and direct variation, 143–144
error analysis, 146
real-life application, 145

Irrational number(s)

defined, 524, 526
error analysis, 529

Isosceles triangle, defined, 472

L

Lateral face(s), 252
formula for, 265

Leaf, defined, 350

Leg(s)

of a right triangle, 516–521
defined, 516, 518
finding the length, 519

Like terms, *See also Algebraic Expression(s)*

combining, 85
to solve equations, 424

defined, 81A
identifying, 81A

Line(s)

graphing, 442–447

intersecting, 467

parallel
 error analysis, 497
 exterior angles, 495–496
 interior angles, 495–496
 project, 498
 and transversals, 492–499

perpendicular

 defined, 494

transversal
 defined, 492, 494

Linear function(s), 448–453

defined, 450
error analysis, 452
slope-intercept form, 450
y-intercept, 450

Line of reflection, defined, 228

M

Markups, 172–177

defined, 174

Meaning of a word

concave, 480
function, 448
opposite, 10
proportional, 110
rate, 98
rational, 50
reflection, 226
rotate, 232

Measurement(s), *See also Area, Perimeter*

comparing, 131

converting
 between metric and customary units, 130–135, AT8–AT9
 error analysis, 134

indirect

 and similar figures, 489

of similar figures, 194–211
 finding unknown, 206–211

Mental math, *Throughout. For example, see:*

- integers
 - adding, 13
 - subtracting, 19

- proportions
 - solving, 119
- rotations, 236

Metric system. *See also Metric units*
defined, 132

Metric units
comparing, 131
converting, 130–135
error analysis, 134

Modeling
direct variation, 139
division of integers, 31
equations, 70–71, 76, 82–83
percents, 158–159
Product of Powers Property, 563
simple interest, 178
writing scientific notation, 589

Multiplication
Associative Property of, 67A
Commutative Property of, 67A
of fractions, 62–67
of integers, 22–27
error analysis, 26
real-life application, 25
Product of Powers Property, 560–565
Property of Equality, 78
to solve proportions, 124, 126
Property of Inequality, 87B–87C
in scientific notation, 589
to solve equations, 76–81

N

Negative exponent(s), 574–579, 582
defined, 576
error analysis, 578
real-life application, 577

Net(s), 256–259
defined, 256
drawing, 270
of a pyramid, 272–273

Number(s)
irrational
defined, 524, 526
real
classifying, 526
comparing, 527
cube root, 537A
defined, 526
perfect cube, 537A

Number line(s), 5

Number sense, Throughout. For example, see:

- angles
 - sum of the measures of, 481
- coordinate planes, 39
- Cross Products Property, 126
- exponents, 558, 578
- finding patterns, 27
- integers, 12
- inverse variation, 146
- percent
 - of increase, 168
- polygons
 - sum of angle measurement of, 481
- proportions
 - solving, 126
- scientific notation, 591
- square roots, 514

O

Open-ended, Throughout. For example, see:
absolute value, 7
angles
classifying, 469
composite solids, 286
decimals
repeating, 55
terminating, 55
drawing a composite solid, 286
equations
solving, 81
with variables on both sides, 432
exponents, 579
fractions
multiplying, 67
integers, 18
adding, 13
dividing, 32
subtracting, 19
inverse operations, 80
inverse variation, 146
measurements
converting, 134
parallel lines, 497
polygons, 482
probability, 388

- dependent events, 409
- independent events, 409
- theoretical, 394
- proportions, 120
 - solving, 126
- rates, 102
- rational numbers
 - adding, 60
 - multiplying, 67

ratios, 114
scale factor, 217
similar figures, 198
similar solids, 335
slope, 446
square roots
approximating, 530
stem-and-leaf plots, 353
surface area of a prism, 260
volume of a pyramid, 314, 315

Opposites, defined, 10
Order of operations, 31
Ordering
rational numbers, 50, 53
Origin, of a coordinate plane, defined, 36
Outcomes, *See also Probability*
defined, 386

P

Parallel line(s)
and transversals, 492–499
Pattern(s)
area
of a similar figure, 201
finding
of surface areas, 283
perimeter
of a similar figure, 201
reflections, 226–227
volume of a pyramid, 311

Percent(s)
of change, 166
defined, 166
error analysis, 168
of decrease, 164–169
defined, 166
error analysis, 168
finding, 167
defined, 160
equation, 158–163
error analysis, 162
real-life application, 161
reasoning, 163
estimating, 158–159
of increase, 164–169
defined, 166
finding, 166
interest, simple, 178–183
defined, 178
error analysis, 182
formula for, 178
modeling, 178
reasoning, 183
modeling, 158–159
prices, 176
Perfect cube(s), defined, 537A

- Perfect square(s)**, defined, 512
- Perimeter**
- finding, 542
 - of a similar figure, 200–205, 208
- Perpendicular line(s)**, defined, 494
- Pi**, 261B, 264
- defined, 261B
 - formula for, 261B, 264
- Plane and solid**
- intersection of, AT7
- Polygon(s)**
- angles of, 476–483
 - error analysis, 481, 482
 - real-life application, 479
 - sum of the angle measures of, 476–483
 - classifying, 476–483
 - concave
 - defined, 480
 - convex, 477, 480
 - defined, 478
 - regular
 - defined, 272, 479
- Polyhedron(s)**, defined, 252
- Population(s)**
- comparing, 373A–373B
 - defined, 370
 - and samples, 368–373
- Power(s)**, *See also* Exponent(s)
- defined, 556
 - multiplying, 562
 - of powers, 562
 - Product of Powers Property, 560–565
 - error analysis, 564
 - modeling, 563
 - of products, 563
 - Quotient of Powers Property, 566–571
 - error analysis, 570
 - real-life application, 569
 - writing, 555
- Prices**
- discounts and markups, 172–177
 - defined, 174
- Prime**
- notation, 223
- Principal**, defined, 180
- Prism(s)**, 256–261
- breaking into pyramids, 311
 - defined, 252
 - drawing, 252
 - nets of, 256–260
 - rectangular
 - surface area of, 256–258
 - volume of, 535
- surface area of**, 256–261
 - defined, 259
 - formula, 285
- triangular**
- surface area of, 256–257, 259
- volume of**, 298–303
 - error analysis, 302
 - formula for, 298–299, 326
 - real-life application, 301
 - reasoning, 314
 - a rectangular, 535
 - writing, 314

Probability, 384–389

 - defined, 387
 - error analysis, 388
 - of events, 386–388
 - defined, 386, 406
 - dependent, 404–411
 - defined, 408
 - independent, 404–411
 - defined, 406
 - experimental, 386, 398–403
 - compared to theoretical, 401
 - defined, 400
 - error analysis, 402
 - experiments, 386
 - conducting, 399, 405
 - defined, 386
 - fair, 393–394
 - fair experiments
 - defined, 393
 - outcomes
 - counting, 387, 399
 - defined, 386
 - determining, 386, 399
 - error analysis, 402
 - favorable, 386, 388
 - theoretical, 390–395
 - compared to experimental, 401
 - defined, 392
 - determining, 392

Process diagram, 68

Product(s)

 - cross products, 113
 - as a quotient, 28

Product of Powers Property, 560–565

 - error analysis, 564
 - modeling, 563

Product Property of Square Roots, 534

Properties

 - Additive Inverse Property, 10
 - Associative Property
 - of Addition, 67A
 - of Multiplication, 67A

Commutative Property

 - of Addition, 67A
 - of Multiplication, 67A

Cross Products Property, 113

of Equality

 - Addition, 72
 - Division, 78
 - Multiplication, 78
 - Subtraction, 72

of Inequality

 - Addition, 87A
 - Division, 87B–87C
 - Multiplication, 87B–87C
 - Subtraction, 87A

Powers

 - Product of, 560–565
 - Quotient of, 566–571

Square Roots

 - Product Property of, 534
 - Quotient Property of, 535

Proportion(s), 110–115

 - cross products, 112, 124–126
 - defined, 112
 - error analysis, 120, 126
 - real-life application, 265
 - research, 127
 - scale drawings, 214–215, 217A–217B
 - of a similar figure, 208–209
 - similar figures, 195
 - solving, 122–127
 - using cross products, 124–126
 - using multiplication, 124, 126

Proportional

 - defined, 112
 - relationships, 141A–141B
 - comparing graphs of, 141B
 - interpreting, 141A

Pyramid(s)

 - defined, 252, 270
 - drawing, 253
 - regular
 - defined, 272
 - surface area of, 272–273, 274
 - similar, 333
 - slant height
 - defined, 272
 - surface area of, 270–275
 - formula, 285
 - real-life application, 273
 - volume of, 310–315
 - formula for, 312, 326
 - open-ended, 314, 315
 - real-life application, 313
 - reasoning, 314
 - writing, 314, 320

Pythagorean Theorem, 516–521

 - converse of, 541

- defined**, 518
error analysis, 520
project, 543
real-life application, 540
using, 538–543
project, 543
- Pythagorean triple**, defined, 541
- Q**
- Quadrant**, defined, 36
Quotient
 a product as, 28
 of two integers, 30
Quotient of Powers Property,
 566–571
 error analysis, 570
 real-life application, 569
- Quotient Property of Square Roots**,
 535
- R**
- Radical sign**, defined, 512
Radicand(s), defined, 512
Radius, 261A, 279
 of a circle, 261A, 279
 formula for, 261A
 defined, 261A
Rate(s), 98–105
 comparing, 105, AT10–AT11
 converting, 133, AT8
 defined, 100
 graphing, 101
 proportion, 114
 research, 99, 103
 unit, 99–100
 defined, 100
Ratio(s), 98–103
 area
 of a similar figure, 203
 cross products, 112
 defined, 100
 equivalent, 112
 golden, 532–533
 constructing, 532
 defined, 532
 perimeter
 of a similar figure, 202
 pi, 261B
 proportional, 110–115
 of a similar figure, 202–203
Rational number(s), 50–55
 adding, 56–61
 real-life application, 59
 as decimals, 52
 error analysis, 54
 decimals as, 53
 defined, 50, 52
 dividing, 62–67
 error analysis, 66
 real-life application, 65
 multiplying, 62–67
 error analysis, 66
 ordering, 50, 53
 reasoning, 61
 subtracting, 56–61
 error analysis, 60
 real-life application, 59
- Reading**
 inequalities, 87A
 prime symbol, 223
 symbol for angle, 196
- Reading exercises**
 integers
 dividing, 32
- Real number(s)**
 classifying, 526
 comparing, 527
 cube root, 537A
 defined, 526
 perfect cube, 537A
- Real-life applications**, *Throughout*.
For example, see:
 absolute value, 5
 angles
 of a polygon, 479
 area of a circle, 513
 composite solid
 volume of, 327
 cones
 surface area of, 279
 volume of, 319
 coordinate planes, 37
 cylinders, 265
 volume of, 307
 equations
 multi-step, 425
 solving, 73, 79, 437
 two-step, 85
 with variables on both sides,
 431
 exponents, 557
 negative, 577
 scientific notation and, 583
 integers
 dividing, 31
 multiplying, 25
 subtracting, 17
 inverse variation, 145
 percent
 equation, 161
 polygons
 angles of, 479
- powers**
Quotient of Powers Property,
 569
- prisms**
 volume of, 301
- proportions**, 125, 265
- pyramids**, 273
 volume of, 313
- Pythagorean Theorem**, 540
- Quotient of Powers Property**, 569
- rational numbers**
 adding, 59
 dividing, 65
 subtracting, 59
- scientific notation**, 583, 591B
- similar figures**
 area of, 203
- slope**, 125, 444
- spheres**, 557
- square roots**, 513
 approximating, 528
- surface area**
 of a cone, 279
 of a cylinder, 265
 of a pyramid, 273
- volume**
 of a composite solid, 327
 of a cone, 319
 of a cylinder, 307
 of a prism, 301
 of a pyramid, 313
- Reasoning**, *Throughout*.
For example, see:
 angles, 199, 498
 classifying, 469
 congruent, 498
 measuring, 469
 sum of the measures of, 482
 of a triangle, 474
- circle graphs**, 366, 367
- cones**
 height of, 281, 321
 slant height, 280
 volume of, 320, 321
- coordinate planes**, 38
- cylinders**
 volume of, 321
- equations**
 multi-step, 426
 percent, 162, 163
 solving, 81, 438, 439
 two-step, 87
 with variables on both sides,
 432
- functions**
 linear, 583
- geometry**
 triangles, 474

- histograms, 358
 mean, median, mode, and range, 359
- inductive, 3, 9, 15, 23, 29
- integers, 7, 19
- lines
 parallel, 498
 transversal, 498
- percents
 discounts and markups, 176
- polygons, 482
- powers
Product of Powers Property, 564
- probability, 388, 411
 experimental, 402
- Product of Powers Property**, 564
- pyramids
 height of, 275
 volume of, 314, 315
- rational numbers, 61
- reflections, 230
- scale factor, 216
- scale model, 217
- scientific notation, 585
 and standard form, 590
- similar figures, 199
 corresponding sides, 210
- similar solids, 335
- simple interest, 182, 183
- slope, 108, 446
- solid(s), 255, 267, 286
 intersection with a plane, AT7
 volume of, 308
- square roots, 514
 perfect squares, 515
- standard form
 and scientific notation, 590
- surface area, 287
 of a composite solid, 286
 of a cylinder, 267
- translations, 225
- triangles
 acute, 475
 angles of, 474
 similar, 490
- volume
 of a cone, 320, 321
 of a cylinder, 320, 321
 of a prism, 303, 314
 of a pyramid, 314, 315
- Reciprocal(s), 64
 to solve equations, 79
- Reflection(s)**, 226–231, AT13
 in a coordinate plane, 229–231, AT13
- defined, 228, AT13
 line of, 228, AT13
 project, 231
- Regular polygon(s)**, defined, 479
- Regular pyramid**, *See also Pyramid(s)*
 defined, 272
- Repeating decimal**, defined, 52
- Right triangle(s)
 error analysis, 520
 hypotenuse of, 516–521
 defined, 516, 518
 finding, 518
- legs of
 defined, 516, 518
 finding, 519
- Pythagorean Theorem and, 516–521
 project, 543
 real-life application, 540
 using, 538–543
 similar, AT18–AT19
- Rise**, defined, 444
- Rotations**, 232–237, AT14
 angle of
 center of
 defined, 234, AT14
 in a coordinate plane, 235–237, AT14
- Rounding, 266, 286
- Run**, defined, 444
- S**
- Sample(s)**
 defined, 370
 error analysis, 372
 making predictions from, 373A
 and populations, 368–373, 373B
- Scale**
 defined, 214
- Scale drawing**, 212–217, 217A–217B
 defined, 214
 finding an actual area, 217A
 making, 212
 recreating, 217B
- Scale factor**, 215–217
 defined, 215
 open-ended, 217
- Scale model(s)**, 215–217
 defined, 214
- Scientific notation**, 591A–591B
 adding numbers in, 591A
 defined, 582
 dividing numbers in, 591B
 real-life application, 591B
- multiplying numbers in, 589
 reading, 580–585
 real-life application, 583
 standard form of, 583, 591B
 error analysis, 584
- subtracting numbers in, 591A
 writing, 586–591
 error analysis, 590
 modeling, 589
 in standard form, 582–583
- Sides**
 corresponding, 196–199
- Similar figures**
 area of, 200–205
 patterns, 201
 ratio of, 203
 real-life application, 203
 corresponding angles, 196–199
 corresponding sides, 196–199
 defined, 196
 drawing, 206
 identifying, 194–199
 and indirect measurement, 209
 perimeter of, 200–205
 patterns, 201
 ratio of, 202
 ratio of
 area, 203
 perimeter, 202
 unknown measures of, 206–211
- Similar solids**
 comparing, 330–331
 defined, 332
 surface area of, 330–337
 volume of, 330–337
 error analysis, 336
- Similar triangle(s)**, *See also Triangle(s)*
 defined, 486, 488
- Simple interest**, *See also Interest*
 defined, 178, 180
- Simplest form**, *See also Algebraic expression(s)*
 defined, 81A
- Slant height**
 of a cone, 278–279
 defined, 272, 278
 of a pyramid, 272
- Slope**, 104–109
 defined, 106, 442, 444
 error analysis, 108, 447
 as a rate, 104–105, 442–447
 real-life application, 125, 444
 rise, 444
 run, 444
 and similar right triangles, AT19

Slope-intercept form, *See also* Linear function(s)
 defined, 450
Solid(s)
 composite, 282–287
 volume of, 324–329
 cones, 276–281
 volume of, 316–321
 cylinders, 262–267
 volume of, 304–309
 drawing, 250–255
 lateral faces, 252
 nets and, 256–259
 oblique, 317
 and plane
 intersection of, AT7
 prisms, 256–261
 volume of, 298–303
 project, 255
 pyramids, 270–275
 volume of, 310–315
 real-life applications, 265, 273, 279
 reasoning, 267, 286, 287, 308
 research, 255
 similar
 surface area of, 330–337
 volume of, 330–337
Solving equations, *See* Equation(s)
Speed, defined, 2
Sphere(s)
 real-life application, 557
 volume of, 557, AT16
Square root(s)
 adding, 534
 approximating, 524–531
 error analysis, 529
 real-life application, 528
 defined, 512
 estimating, 527
 finding, 510–515
 error analysis, 514
 real-life application, 513
 and golden ratio, 532–533
 of perfect square
 defined, 512
 Product Property of, 534
 Quotient Property of, 535
 radical sign
 defined, 512
 radicand
 defined, 512
 simplifying, 532–537
 error analysis, 536
 subtracting, 534

Standard form
 of scientific notation, 582–583
 error analysis, 584
 writing, 582
Standardized test practice
 algebraic expressions
 simplifying, 81B
 angles, 495
 corresponding, 495
 coordinate plane, 36
equations
 solving, 73
 with variables on both sides, 431
exponents
 powers and, 563
 scientific notation and, 589
graphing inverse variation, 145
lines
 parallel, 495
median, 351
percent of decrease, 167
powers
 Product of Powers Property, 563
probability
 experimental, 400
Product of Powers Property, 563
Pythagorean Theorem, 519
rational numbers
 multiplying, 65
right triangles, 519
rotation, 234
samples and populations, 371
scale, 215
scientific notation, 589
similar figures, 208
stem-and-leaf plots, 351
surface area of a solid, 284
triangles
 angle measures of, 473
volume
 of a cylinder, 307
 of a similar solid, 334
Stem, defined, 350
Stem-and-leaf plot(s), 348–353
 defined, 350
 error analysis, 352
 leaf
 defined, 350
 making, 350
 research, 349, 353
 stem
 defined, 350
Study tips
 algebraic expressions, 81A
angles
 congruent, 488
 corresponding, 494
 exterior, 496
 interior, 496
direct variation, 138
discounts, 174
equations
 simplifying, 84
estimating pi, 261B
estimating square root, 527
exponents, 25, 562
expressions
 simplifying, 569
fair experiments, 393
hypotenuse of a right triangle, 518
inequalities, 87A
inverse operations, 87A
inverse variation, 144
legs of a right triangle, 518
number properties, 67A
numbers
 without exponents, 562
percents, 174
powers
 with negative bases, 556
 Quotient of Powers Property, 569
probability, 393
proportional relationships, 141A
rational numbers
 adding, 58
right triangles
 hypotenuse of, 518
 legs of, 518
rotations, 234
scale, 214
scientific notation, 582
 and standard form, 589
slope, 444
square roots
 simplifying, 534
 of zero, 512
surface area of a solid, 334
transversals, 496
triangles
 congruent angles of, 488
volume of a cone, 318
volume of a cylinder
 formula for, 306
volume of a prism, 300
volume of a pyramid, 312
volume of a solid, 334
Subtraction
 of integers, 14–19
 error analysis, 18

open-ended, 18
real-life application, 17
Property of Equality, 72
Property of Inequality, 87A
of rational numbers, 56–61
error analysis, 60
in scientific notation, 591A
to solve equations, 70–75
of square roots, 534

Summary triangle(s), 170, 522
Supplementary angles, *See also Angle(s)*

defined, 464, 466, AT2

Surface area, 250
of a composite solid, 282–287
of a cone, 276–281
formula for, 279
real-life application, 279
of a cylinder, 262–267
error analysis, 267
formula for, 264
real-life application, 265
of a prism, 256–261
defined, 256
of a pyramid, 270–275
formula for, 272
real-life application, 273
regular, 272–273
of similar solids, 330–337
and volume
comparing, 330–331

Survey(s), 368–373

Symbol(s)
for angle, 196
for congruent sides, 472
cube root, 537A
prime, 223
radical sign, 512

T

Table(s), 428
for solving equations, 434–439
real-life application, 437
Terminating decimal, defined, 52
Tessellation(s), 220–221, 233
defined, 220
Theorem, defined, 516
Theoretical probability, *See also Probability*
defined, 392
Three-dimensional figures, *See also Solid(s)*
defined, 252
Transformation(s)
defined, 222
dilation, AT15
image, 222

prime notation, 223
reflections, 226–231, AT13
in a coordinate plane, 229–231, AT13
defined, 228, AT13
line of, 228, AT13
rotations, 232–237, AT14
in a coordinate plane, 235–237, AT14
defined, AT14
tessellations, 220–221, 233
translations, 220–225, AT12
in a coordinate plane, 223–225, AT12
defined, 222, AT12
Translation(s), 220–225, AT12
in a coordinate plane, 223–225, AT12
defined, 222, AT12
Transversal(s), *See also Line(s)*
defined, 492, 494
and parallel lines, 492–499
Triangle(s)
acute, 472
angles of
sum of measures, 473
area of, 259
classifying, 470–475
error analysis, 474
congruent sides of
defined, 472
symbol for, 472
constructing, AT4–AT6
equiangular
defined, 472
equilateral
defined, 472
indirect measurement, 489
isosceles
defined, 472
obtuse, 472
right, 472
error analysis, 520
hypotenuse of, 518
legs of, 518
Pythagorean Theorem and, 516–521, 538–543
sides of, 470–475
similar
defined, 486, 488
error analysis, 490
project, 491
right, AT18–AT19
using, 486–491
Two-step equations, *See Equation(s)*
Two-step inequalities, *See Inequality*

U

Unit rate(s), 99–103, 104–105
defined, 100
research, 103
U.S. customary system, *See also Customary unit(s)*
defined, 132

V

Variables, 81A, 81B
on both sides of an equation, 426–433
real-life application, 431

Velocity, 2–3
defined, 2
Vertical angles, *See also Angle(s)*
defined, 467, AT3
Volume, 250
comparing, 567, 575
of a composite solid, 324–329
formula for, 326
real-life application, 327
of a cone, 316–321
error analysis, 320
formula for, 316, 318
real-life application, 319

of a cube
formula for 537A
of a cylinder, 304–309
formula for, 306
real-life application, 307
reasoning, 320, 321
defined, 300
estimating, 324
of oblique solids, 317
of a prism, 298–303
error analysis, 302
formula for, 298–299
real-life application, 301
reasoning, 314
writing, 314

of a pyramid, 310–315
formula for, 312
open-ended, 314, 315
real-life application, 313
reasoning, 314
writing, 314, 320
of similar solids, 330–337
error analysis, 336
of a sphere
formula for, 557, AT16
and surface area
comparing, 330–331

W

Word magnet, 396
Writing, *Throughout. For example, see:*
 additive inverse, 12
area
 of a similar figure, 204
circle graphs, 367
converting units of measure, 134
coordinate planes, 38
definitions, 574, 575
direct variation, 140
equations, 74
 solving, 80, 86
 two-step, 86, 87
estimating square roots, 527
exponents
 in scientific notation, 582
fractions, 54
integers
 dividing, 32
 multiplying, 26
 subtracting, 18
interest rates, 182
inverse variation, 146
percent
 of decrease, 168

percents

 discounts, 176
 markups, 176

perimeter

 of a similar figure, 204

proportions, 120

 solving, 126

rational numbers

 adding, 60
 dividing, 66
 multiplying, 66

reflections, 230**rotations, 237****scientific notation, 582, 586–591**

 error analysis, 590

 real-life application, 583

 in standard form, 582, 584

similar figures

 area of, 204
 perimeter of, 204

solids, 254**stem-and-leaf plots, 352****unit rates, 102****volume**

 of a composite solid, 328
 of a cone, 320
 of a prism, 314
 of a pyramid, 314, 320

X

x-axis, defined, 36

Y

y-axis, defined, 36

y-intercept, *See also* Linear function(s)
 defined, 450

Z**Zero**

 as an exponent, 574–579
 defined, 576
square root of, 512