

**Problem solving**

choosing a method of  
solution, 103, 285, 317,  
425, 442, 482, 545, 672–  
673

open-ended; numerous  
exercises, *see*, for example,  
171 (Exs. 33, 34),  
193 (Ex. 28),  
223 (Exs. 20, 23),  
230 (Exs. 1–8),  
303 (Exs. 32–34),  
348 (Exs. 23, 24, 26),  
360 (Ex. 30),  
361 (Exs. 31, 32)

*See also* Explorations

*See also* Applications and  
Proof(s), strategies for

**Products of mappings**, 599–  
602, 605–606

**Projection**, 571, 576  
orthographic, 90

**Proof(s)**

by contrapositive,  
215  
coordinate geometry in,  
556–563, 673  
extraneous information in,  
131 (Exs. 9, 10)  
flow, 655–656  
indirect, 214–215  
key steps, 147  
logical, 648–652  
paragraph form, 147  
parts of, 60  
planning, 60–62  
reasons used, 45  
rules of inference, 648  
strategies for, 61, 85, 94,  
147, 172, 256  
of theorems, 43–45  
transformational geometry  
in, 673  
two-column, 38  
with vectors, 542–543  
*See also* Argument, making  
a convincing

**Properties**

of algebra, 14 (Ex. 14),  
37–39, 43 (Ex. 15), 204  
of arcs and angles, 339–  
340  
of congruence, 37  
of inequality, 204  
of parallel lines, 78–79  
of parallelograms, 167  
of proportions, 245

of regular pyramids, 482  
of similar solids, 508–509

**Proportion**, 242

extended, 242  
extremes, 245  
means, 245  
properties of, 245  
terms, 242, 245

**Proportional lengths**, 269–  
270

**Protractor**, 17

**Ptolemy's Theorem**, 356

**Pyramid(s)**, 8, 127, 294,  
482–484

Great, 488  
inscribed, 495  
lateral area of, 482–484  
parts of, 482  
regular, 482  
sketching, 485  
step, 488  
volume, 483–484, 517

**Pythagoras**, 290

**Pythagorean Theorem**, 290–

291, 294, 299,  
438 (Ex. 34)  
converse of, 295–296

**Pythagorean triples**, 299

**Quadrants**, 113, 523

**Quadratic equations**, 163

**Quadrilateral**, 101

inscribed, 351  
skew, 181

**Radical(s)**, 280, 287

**Radius**

of circle, 329  
of cylinder, 490  
of regular polygon, 441

**Ratio(s)**, 241–242

of areas, 456–457  
golden, 252, 253, 261  
in similar figures, 264, 457  
in similar solids, 508–509  
trigonometric, 305–320

**Ray(s)**, 11

endpoint of, 11  
opposite, 11  
parallel, 73  
perpendicular, 56

**Reading Geometry**, xii–xiii

**Reasoning**

deductive, 45, 106  
indirect, 214  
inductive, 106  
logical, 209, 644–654  
valid and flawed, 649–  
651

**Reasoning backward**, 61,  
147

**Rectangle**, 184–185

area, 424  
golden, 252, 253, 385  
inscribed, 514

**Rectangular solid**, 475

diagonal of, 293

**Reflection(s)**, 577–578, 659

composite of, 601–602  
glide, 584–585  
inverse of, 606  
line of, 577  
in a plane, 580  
solution by, 225

**Region**, area of, 423–424

**Regular polygon**, 103

apothem of, 441  
area of, 441, 445  
center of, 441  
central angle of, 441  
inscribed, 440  
perimeter, 445  
radius of, 441

**Relation, equivalence**, 43,  
538 (Ex. 22)

**Replacement, rules of**, 651

**Reviews**, *see* Algebra Review;  
Chapter Review; Chapter  
Test; College Entrance  
Exams, Preparing for;  
Cumulative Review;  
Mixed Review Exercises;  
and Self-Tests

**Rhombus**, 184–185

area of, 430

**Right triangle(s)**, 93, 141,  
285–325

angles of, 94  
congruent, 141, 143  
hypotenuse of, 141  
midpoint of, 185  
legs of, 141

Pythagorean Theorem, 290–  
291, 294, 299,  
438 (Ex. 34)

converse of, 295–296

similarity in, 285–287

special, 300–301

trigonometry, 305–320