INDEX

A

Absolute value, 637
Adding polynomials, 28–31
Adding rational expressions, 53–71
Ambiguous case, 300–312
Amortization period, 544
Amortization tables, 544–570
Amortize, 544
Amount, 498
of an ordinary annuity, 526–533
Amplitude, 357
Angle of depression/elevation, 268
Angle of rotation, 351–354
Annuity. See Ordinary annuity
Arithmetic sequences, 436–446, 457–464
and simple interest and linear growth, 498–500
Arithmetic series, 465–471
Asymptote, 183

C

Canada Savings Bonds, 514
Career Connection
accounting, 456
communications, 664
crafts, 420
microbiology, 26
publishing, 133
surveying, 294
veterinary medicine, 193
Centre of a circle, 609
Centre of a hyperbola, 640
Circles, 608–618
Combinations of transformations, 233–243
Common difference, 436
Common factoring, 3
Common ratio, 447

D

Dependent variable, 173
Directrix of a parabola, 653
Discontinuous graph, 183
Distinct real zeros, 121
Dividing rational expressions, 44–52, 71
Domain, 174

E

Ellipses, 619–636
Entire radical, 102
Equal real zeros, 121
Equation. See Exponential equations, Quadratic equations, Solving linear equations, and Trigonometric equations
Expansion, 223
Explicit formula, 457
Exponential equations, 19–27
Exponential function, 513
Exponent laws for integral exponents, 4–11
Exponent rules, 427, 497
Evaluating expressions, 169, 427, 587
Evaluating radicals, 99

F

Factoring ax² + bx + c, 3
Finding angles in right triangles, 265
Finding sides in right triangles, 265
First-degree inequality, 72
Focal radii of an ellipse, 619
Focal radii of a hyperbola, 637
Focus (foci) of an ellipse, 619
Focus (foci) of a hyperbola, 637
Focus of a parabola, 653
Function, 170. See also Exponential function, Functions defined by f (x) = 1/x, Functions defined by f (x) = √x, Inverse functions, Periodic function, and Quadratic function
Functions defined by f (x) = 1/x properties, 182–183
Functions defined by f (x) = √x properties, 182–183

G

The Geometer’s Sketchpad.® See Technology Index
Graphing calculator. See Technology Index
Graphing equations, 427, 587
Graphing quadratic functions, 99
Geometric sequences, 447–456
and compound interest and exponential growth, 512–515
Geometric series, 472–478
Getting Started
communications satellites, 586
comparing costs, 496
daylight hours, 326
exploring sequences, 426
frequency ranges, 2
human physiology, 168
parallactic displacement, 264
store profits, 98

H
Hyperbolas, 637–652

I
Imaginary number, 104
Imaginary unit, 103
Imaginary zeros, 121
Independent variable, 173
Inequalities
graphing, 3, 74–81
solving first degree, 72–82
Initial arm, 276
Inquiry process steps, 83–84, 153
Interest. See Compound interest
Simple interest
Interest rate, 498
Intersections of lines and conics, 675–687
Invariant point, 196
Inverse functions, 208–220
Investigate & Apply
confocal conics, 584–696
cosine law and the ambiguous case, 312
cost of car ownership, 571
frieze patterns, 244–245
interpreting a mathematical model, 153
modelling double helixes, 411
modelling restrictions graphically, 83–84
relating sequences and systems of equations, 479
Irrational numbers, 105
Iteration, 149

L
Length of a line segment, 587
Linear relation, 500
Loci, 588–593, 601–607
equations of, 594–600
Logic Power, 143, 262, 446, 674

M
Major axis of an ellipse, 622
Microsoft® Excel. See Technology
Index
Midpoint formula, 587
Minor axis of an ellipse, 622
Mixed radical, 102
Modelling Math
falling objects, 167, 191, 219, 232, 242
making financial decisions, 495, 510, 533, 542, 569
measurements of lengths and areas, 97, 108, 118, 132
modelling problems algebraically, 1, 25, 60, 80
motion in space, 585, 634, 650, 663
motion of a pendulum, 425, 445, 455, 478
ocean waves, 325, 362, 377, 388–390
ship navigation, 263, 274, 293, 310, 311
Modelling periodic behaviour, 355–362
Mortgages, 544–570
amount of, 526–533
present value of, 534–543

N
Number Power, 26, 435

O
Operations with complex numbers in rectangular form, 144–152
Operations with polynomials, 28–31
Operations with radicals, 135–143
Ordinary annuity, 526
amount of, 526–533
present value of, 534–543
Periodic function, 356
combinations of transformations of, 378–391
stretches of, 367–377
translations of, 378–391
Power, 6
Present value, 516–525
of an ordinary annuity, 534–543
Principal, 498
Problem Solving
guess and check, 489–491
look for a pattern, 161–163
model and communicate solutions, 93–94
solve a simpler problem, 421–422
solve rich estimation problems, 258–260
use a data bank, 697–699
use a diagram, 319–321
use logic, 580–582
using the strategies, 95, 164, 261, 322, 423, 492, 583, 700
Pure imaginary number, 103
Quadratic equations
solving, 3, 99, 120–134, 327, 687
Quadratic formula, 99, 587
Quadratic functions
finding the maximum or minimum by completing the square, 110–119
graphing, 99
rewriting in the form
y = a(x – h)^2 + k, 99, 587
Quotient identity or relation, 393

Radian, 330
and angle measure, 328–340
Radicals, 99, 100–109, 135–143
Radius, 609
Range, 174
Rational exponents, 11–18
Rational expressions, 35
adding, 53–71
dividing, 44–52, 71
multiplying, 44–52, 70
simplifying, 35–43, 70
subtracting, 53–71
Rationalizing the denominator, 138
Rational numbers, 105
Real numbers, 105
Real zeros, 121
Recursive formula, 457–464
Reflections, 169, 194–207  
Relation, 170  
Review of Prerequisite Skills  
(Appendix A), 702–716

<table>
<thead>
<tr>
<th>S</th>
<th></th>
</tr>
</thead>
</table>
| Sequences, 428–435  
arithmetic, 436–446, 467–464  
geometric, 447–464  
recursion formulas, 457–464  
Series, 465  
arithmetic, 465–471  
geometric, 472–478  
Simple interest, 498  
and arithmetic sequences and linear growth, 498–500  
Simplifying expressions, 3, 427, 587  
Simplifying radicals, 100–109  
Simplifying rational expressions, 35–43, 70  
Sine  
of angles greater than 90°, 276–282  
of angles less than 90°, 266–275  
of any angle, 341–350  
of negative angles, 353–354  
Sine function  
combinations of transformations of, 378–391  
sketching the graph of, 363–364  
stretches of, 367–377  
translations of, 378–391  
Sine law, 283–311  
Spreadsheets, See Technology Index  
Solving exponential equations, 19–27  
Solving linear equations, 3, 427, 498  
Solving linear systems, 427, 587  
Solving proportions, 265  
Solving quadratic equations, 3, 99, 120–134, 327, 587  
Solving right triangles, 266–275  
Solving triangles, 283–295  
Solving trigonometric equations, 401–410  
Standard position, 276  
Steps of the inquiry process, 83–84, 153  
Stretches, 169, 221–232  
of parabolas, 169  
of periodic functions, 367–377  
Subtended angle, 328  
Subtracting polynomials, 28–31  
Subtracting rational expressions, 53–71

T  
Tangent function  
sketching the graph of, 365–366  
Tangent  
of angles less than 90°, 266–275  
of any angle, 341–350  
of negative angles, 353–354  
Technology Extension. See Technology Index  
Terminal arm, 276  
Term of a mortgage, 544  
Transformations. See Combinations, Reflections, Stretches and Translations  
Translations, 169  
horizontal and vertical, 184–193  
Transverse axis of a hyperbola, 640  
Trigonometric equations, 401–409  
Trigonometric identities, 392–400  
Trigonometric ratios, 265, 327  
of any angle, 341–350  
Trigonometry  
ambiguous case, 300–312  
cosine law, 283–295  
cosine of angles greater than 90°, 276–282  
of right triangles, 266–275  
sine law, 283–295  
sine of angles greater than 90°, 276–282  
special angles/triangles, 341

V  
Vertical line test, 172  
Vertices of an ellipse, 622  
Vertices of a hyperbola, 640

W  
Web Connection. See Technology Index  
Word Power, 43

Z  
Zap-a-Graph. See Technology Index  
Zeros, 121