

Illustrated Glossary

acute angle: an angle measuring less than 90°

acute triangle: a triangle with three acute angles



algebraic expression: a mathematical expression containing a variable; for example, $6x - 4$ is an algebraic expression

approximate: a number close to the exact value of an expression; the symbol \doteq means “is approximately equal to”

area: the number of square units needed to cover a region

array: an arrangement in rows and columns

average: a single number that represents a set of numbers (see *mean*, *median*, and *mode*)

axis of rotation: the straight line around which an object is turned

bar graph: a graph that displays data by using horizontal or vertical bars

bar notation: the use of a horizontal bar over a decimal digit to indicate that it repeats; for example, $1.\bar{3}$ means $1.333\ 333\ \dots$

base: the side of a polygon or the face of an object from which the height is measured

bisector: a line that divides a line segment or an angle into two equal parts

capacity: the amount a container can hold

Cartesian Plane: another name for a coordinate grid (see *coordinate grid*)

central angle: the angle between the two radii that form a sector of a circle; also called sector angle

certain event: an event with probability 1, or 100%

chance: a description of a probability expressed as a percent

circle graph: a diagram that uses sectors of a circle to display data

circumference: the distance around a circle, also known as the perimeter of the circle

common denominator: a number that is a multiple of each of the given denominators; for example, 12 is a common denominator for the fractions $\frac{1}{3}$, $\frac{5}{4}$, $\frac{7}{12}$

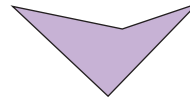
common factor: a number that is a factor of each of the given numbers; for example, 3 is a common factor of 15, 9, and 21

commutative property: the property of addition and multiplication that states that numbers can be added or multiplied in any order; for example, $3 + 5 = 5 + 3$; $3 \times 5 = 5 \times 3$

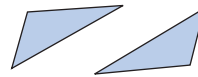
composite number: a number with three or more factors; for example, 8 is a composite number because its factors are 1, 2, 4, and 8

composite shape: the result of combining one or more shapes to make a new shape

concave polygon: has at least one angle greater than 180°



congruent: shapes that match exactly, but do not necessarily have the same orientation

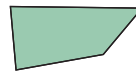


consecutive numbers: integers that come one after the other without any integers missing; for example, 34, 35, 36 are consecutive numbers, so are -2 , -1 , 0, and 1

conservation of area: under a transformation, the area of a shape does not change

constant term: the number in an expression or equation that does not change; for example, in the expression $4x + 3$, 3 is the constant term

convex polygon: has all angles less than 180°



coordinate axes: the horizontal and vertical axes on a grid

coordinate grid: a two-dimensional surface on which a coordinate system has been set up

coordinates: the numbers in an ordered pair that locate a point on the grid (see *ordered pair*)

cube: an object with six congruent square faces

cubic units: units that measure volume

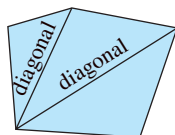
cylinder: an object with two parallel, congruent, circular bases



database: an organized collection of facts or information, often stored on a computer

denominator: the term below the line in a fraction

diagonal: a line segment that joins two vertices of a shape, but is not a side



diameter: the distance across a circle, measured through its centre

digit: any of the symbols used to write numerals; for example, 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9

dimensions: measurements, such as length, width, and height

discount: the amount by which a price is reduced

discrete data: data that can be counted

distributive property: the property stating that a product can be written as a sum or difference of two products; for example, $a(b + c) = ab + ac$, $a(b - c) = ab - ac$

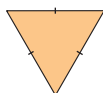
dividend: the number that is divided

divisor: the number that divides into another number

double bar graph: a bar graph that shows two sets of data

equation: a mathematical statement that two expressions are equal

equilateral triangle: a triangle with three equal sides



equivalent: having the same value; for example, $\frac{2}{3}$ and $\frac{6}{9}$; 3:4 and 9:12

estimate: a reasoned guess that is close to the actual value, without calculating it exactly

evaluate: to substitute a value for each variable in an expression

even number: a number that has 2 as a factor; for example, 2, 4, 6

event: any set of outcomes of an experiment

experimental probability: the probability of an event calculated from experimental results

expression: a mathematical phrase made up of numbers and/or variables connected by operations

factor: to factor means to write as a product; for example, $20 = 2 \times 2 \times 5$

formula: a rule that is expressed as an equation

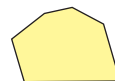
fraction: an indicated quotient of two quantities

frequency: the number of times a particular number occurs in a set of data

greatest common factor (GCF): the greatest number that divides into each number in a set; for example, 5 is the greatest common factor of 10 and 15

height: the perpendicular distance from the base of a shape to the opposite side or vertex; the perpendicular distance from the base of an object to the opposite face or vertex

hexagon: a six-sided polygon



horizontal axis: the horizontal number line on a coordinate grid

hypotenuse: the side opposite the right angle in a right triangle

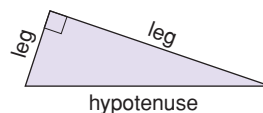


image: the shape that results from a transformation

impossible event: an event that will never occur; an event with probability 0, or 0%

improper fraction: a fraction with the numerator greater than the denominator; for example, both $\frac{6}{5}$ and $\frac{5}{3}$ are improper fractions

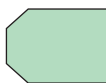
independent events: two events in which the result of one event does not depend on the result of the other event

inspection: solving an equation by finding the value of the variable by using addition, subtraction, multiplication, and division facts

integers: the set of numbers
... $-3, -2, -1, 0, +1, +2, +3, \dots$

inverse operation: an operation that reverses the result of another operation; for example, subtraction is the inverse of addition, and division is the inverse of multiplication

irregular polygon: a polygon that does not have all sides equal or all angles equal



isometric: equal measure; on isometric dot paper, the line segments joining 2 adjacent dots in any direction are equal

isometric drawing: a representation of an object as it would appear in three dimensions

isosceles triangle: a triangle with two equal sides



legend: part of a circle graph that shows what category each sector represents

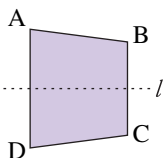
legs: the sides of a right triangle that form the right angle; (see *hypotenuse*)

linear relation: a relation that has a straight-line graph

line graph: a graph that displays data by using points joined by line segments

line segment: the part of a line between two points on the line

line symmetry: a shape that can be divided into 2 congruent parts, so that the parts coincide when the shape is folded along a line of symmetry



lowest common multiple (LCM): the lowest multiple that is the same for two numbers; for example, the lowest common multiple of 12 and 21 is 84

mass: the amount of matter in an object

mean: the sum of a set of numbers divided by the number of numbers in the set

measure of central tendency: a single number that represents a set of numbers (see *mean, median, and mode*)

median: the middle number when data are arranged in numerical order; if there is an even number of data, the median is the mean of the two middle numbers

midpoint: the point that divides a line segment into two equal parts

mixed number: a number consisting of a whole number and a fraction; for example, $1\frac{1}{18}$ is a mixed number

mode: the number that occurs most often in a set of numbers

multiple: the product of a given number and a natural number; for example, some multiples of 8 are 8, 16, 24, ...

natural numbers: the set of numbers 1, 2, 3, 4, 5, ...

negative number: a number less than 0

net: a pattern that can be folded to make an object

numerator: the term above the line in a fraction

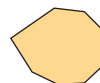
numerical coefficient: the number by which a variable is multiplied; for example, in the expression $4x + 3$, 4 is the numerical coefficient

obtuse angle: an angle whose measure is greater than 90° and less than 180°

obtuse triangle: a triangle with one angle greater than 90°



octagon: an eight-sided polygon



odd number: a number that does not have 2 as a factor; for example, 1, 3, 7

operation: a mathematical process or action such as addition, subtraction, multiplication, or division

opposite integers: two integers with a sum of 0; for example, +3 and -3 are opposite integers

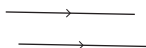
ordered pair: two numbers in order, for example, (2, 4); on a coordinate grid, the first number is the horizontal coordinate of a point, and the second number is the vertical coordinate of the point

order of operations: the rules that are followed when simplifying or evaluating an expression

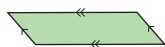
origin: the point where the x -axis and the y -axis intersect

outcome: a possible result of an experiment or a possible answer to a survey question

parallel lines: lines on the same flat surface that do not intersect



parallelogram: a quadrilateral with both pairs of opposite sides parallel



part-to-part ratio: a ratio that compares a part of the whole to another part of the whole

part-to-whole ratio: a ratio that compares a part of the whole to the whole

pentagon: a five-sided polygon



percent: the number of parts per 100; the numerator of a fraction with denominator 100

percent decrease: to calculate a percent decrease, divide the decrease by the original amount, then write the quotient as a percent

$$\text{Percent decrease (\%)} = \frac{\text{Decrease}}{\text{Original amount}} \times 100$$

percent increase: to calculate a percent increase, divide the increase by the original amount, then write the quotient as a percent

$$\text{Percent increase (\%)} = \frac{\text{Increase}}{\text{Original amount}} \times 100$$

perfect square: a number that is the square of a whole number; for example, 16 is a perfect square because $16 = 4^2$

perimeter: the distance around a closed shape

perpendicular lines: intersect at 90°

pictograph: a graph that uses a symbol to represent a certain number, and repetitions of the symbol illustrate the data (see page 384)

plane: a flat surface with the property that a line segment joining any two points lies completely on its surface

polygon: a closed shape that consists of line segments; for example, triangles and quadrilaterals are polygons

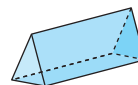
polyhedron (plural, polyhedra): an object with faces that are polygons

population: the set of all things or people being considered

prediction: a statement of what you think will happen

prime number: a whole number with exactly two factors, itself and 1; for example, 2, 3, 5, 7, 11, 29, 31, and 43

prism: an object that has two congruent and parallel faces (the *bases*), and other faces that are parallelograms



probability: the likelihood of a particular outcome; the number of times a particular outcome occurs, written as a fraction of the total number of outcomes

product: the result when two or more numbers are multiplied

proper fraction: a fraction with the numerator less than the denominator; for example, $\frac{5}{6}$

proportion: a statement that two ratios are equal; for example, $n:24 = 3:4$

pyramid: an object that has one face that is a polygon (the *base*), and other faces that are triangles with a common vertex

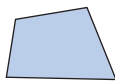


Pythagorean Theorem: the rule that states that, for any right triangle, the area of the square on the hypotenuse is equal to the sum of the areas of the squares on the legs

Pythagorean triple: three whole-number side lengths of a right triangle

quadrant: one of four regions into which coordinate axes divide a plane

quadrilateral: a four-sided polygon



quotient: the result when one number is divided by another

radius (plural, radii): the distance from the centre of a circle to any point on the circle

range: the difference between the greatest and least numbers in a set of data

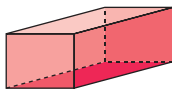
rate: a comparison of two quantities measured in different units

ratio: a comparison of two or more quantities with the same unit

reciprocals: two numbers whose product is 1; for example, $\frac{2}{3}$ and $\frac{3}{2}$

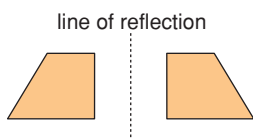
rectangle: a quadrilateral that has four right angles

rectangular prism: a prism that has rectangular faces



rectangular pyramid: a pyramid with a rectangular base

reflection: a transformation that is illustrated by a shape and its image in a line of reflection



reflex angle: an angle between 180° and 360°



regular polygon: a polygon that has all sides equal and all angles equal

regular prism: a prism with regular polygons as bases; for example, a cube

regular pyramid: a pyramid with a regular polygon as its base; for example, a tetrahedron

related denominators: two fractions where the denominator of one fraction is a factor of the other

relation: a rule that associates two terms

repeating decimal: a decimal with a repeating pattern in the digits to the right of the decimal point; it is written with a bar above the repeating digits; for example, $\frac{1}{15} = 0.0\overline{6}$

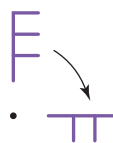
rhombus: a parallelogram with four equal sides

right angle: a 90° angle

right triangle: a triangle that has one right angle



rotation: a transformation in which a shape is turned about a fixed point



scale: the numbers on the axes of a graph

scalene triangle: a triangle with all sides different

sector: part of a circle between two radii and the included arc

sector angle: see *central angle*

simplest form: a ratio with terms that have no common factors, other than 1; a fraction with numerator and denominator that have no common factors, other than 1

spreadsheet: a computer-generated arrangement of data in rows and columns, where a change in one value results in appropriate calculated changes in the other values

square: a rectangle with four equal sides

square number: the product of a number multiplied by itself; for example, 25 is the square of 5

square root: a number which, when multiplied by itself, results in a given number; for example, 5 is a square root of 25

statistics: the branch of mathematics that deals with the collection, organization, and interpretation of data

straight angle: an angle measuring 180°



surface area: the total area of the surface of an object

symmetrical: possessing symmetry (see *line symmetry*)

systematic trial: solving an equation by choosing a value for the variable, then checking by substituting

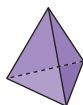
term: (of a fraction) the numerator or the denominator of the fraction

(of a ratio) each of the quantities constituting a ratio; for example, in the ratio 4:5, 4 and 5 are both terms

terminating decimal: a decimal with a certain number of digits after the decimal point; for example, $\frac{1}{8} = 0.125$

tessellate: to use congruent copies of a shape to cover a plane with no overlaps or gaps

tetrahedron: an object with four equal triangular faces; a regular triangular pyramid



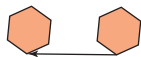
theoretical probability: the number of favourable outcomes written as a fraction of the total number of possible outcomes

three-dimensional: having length, width, and depth or height

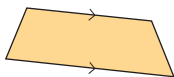
three-term ratio: a comparison of three quantities with the same unit

transformation: a translation, rotation, or reflection

translation: a transformation that moves a point or a shape in a straight line to another position on the same flat surface



trapezoid: a quadrilateral that has one pair of parallel sides



triangle: a three-sided polygon

two-dimensional: having length and width, but no thickness, height, or depth

two-term ratio: a comparison of two quantities with the same unit

unit fraction: a fraction that has a numerator of 1

unit price: the price of one item, or the price of a particular mass or volume of an item

unit rate: a quantity associated with a single unit of another quantity; for example, 6 m in 1 s is a unit rate; it is written as 6 m/s

variable: a letter or symbol representing a quantity that can vary

vertex (plural, vertices): the point where 2 sides of a shape meet, or the point where 3 or more edges of an object meet

vertical axis: the vertical number line on a coordinate grid

volume: the amount of space occupied by an object

whole numbers: the set of numbers 0, 1, 2, 3, ...

x-axis: the horizontal number line on a coordinate grid

y-axis: the vertical number line on a coordinate grid

zero pair: two opposite numbers whose sum is equal to zero

zero property: the property of addition that states adding 0 to a number does not change the number; for example, $3 + 0 = 3$; for multiplication, multiplying a number by 0 results in the product 0; for example, $3 \times 0 = 0$

Index

A

acute triangle, 39, 40, 464
algebra,
 solving equations involving
 fractions with, 334, 335
 solving equations with, 327–330
algebra tiles,
 modelling the distributive
 property with, 340
 solving equations with, 320–323,
 328, 329
area,
 of a circle, 209
 of a rectangle, 6, 105
 of a square, 7, 17–19, 22–24, 40,
 41, 47, 48
 of a triangle, 18
area model,
 multiplying fractions with, 115,
 116
 multiplying mixed numbers with,
 122, 123
ascending order, 14
average speed, 296, 297
axis of rotation, 441–444

B

balance-scales model,
 solving equations with, 319, 320,
 327
“bank” model,
 for dividing integers, 77, 80
 for multiplying integers, 65, 66
bar graph, 382, 384, 385
 constructing with spreadsheet
 software, 391
 formatting on spreadsheet
 software, 403
 misrepresented data on, 395, 396
base of a net, 171
base of a prism vs. base of a
 polygon, 184
brackets, 85, 90, 91, 154

C

calculators,
 investigating square roots with,
 29
circle,
 area of, 209
 circumference of, 209
circle graph, 382, 384–386
 constructing with spreadsheet
 software, 392
 misrepresented data on, 396
circumference, 209

clockwise rotation, 441–444, 457,
 459, 474
coloured tiles,
 dividing integers with, 80
 multiplying integers with, 65, 66
 solving equations with, 318
common denominators, 123
 dividing fractions with, 136–138
 dividing mixed numbers with,
 142
 subtracting fractions with, 154
common factors, 124
 in multiplying fractions, 115–117
commutative property, 71
composite shape, 467
concave quadrilateral, 464
congruent bases, 171
congruent circles, 171, 210
congruent number, 6
congruent shapes, 457, 458, 475
conservation of area, 473
convex quadrilateral, 464
counterclockwise rotation, 441–444,
 457, 459, 473
counters,
 multiplying fractions by whole
 numbers with, 106
 multiplying fractions with, 111
cube, 171
cubic centimetres (cm³), 196, 197,
 199 *Practice*
curved brackets, 85, 90, 91
cylinder, 171, 214 *Math Link*
 surface area of, 209–211
 volume of, 215–217

D

data,
 formatting on spreadsheet
 software, 403, 404
 misrepresented, 394–398
decagons, 474
decimal percent, 235
decimals,
 relating to fractions and
 percents, 234–238, 242–245,
 248–252, 282, 283
descending order, 14
diorama, 228 *Unit Problem*
discount, 257, 258
discrete data, 360, 383
distributive property, 71, 72, 338–341
 solving equations with, 344–346
dividend, 12, 85
division equations, 131, 136
division facts, 13, 85

divisor, 12, 85
double bar graph, 383
double line graph, 404

E

edge of a net, 171
equations,
 involving distributive property,
 344–346
 involving fractions, 333–335
 models for solving with, 318–323
 of a linear relation, 351–355,
 359–362
 solving using algebra, 327–330
equivalent fractions, 116
equivalent ratios, 269–273, 288–290
 comparing ratios with, 280, 281
events, 407–410, 417–419
expand, 341
expanded form of a number, 72
experimental probability, 423

F

faces of a net, 171
factors, 11–14, 115
fractal, 164 *Unit Problem*
fraction circles,
 dividing whole numbers by
 fractions with, 132
 multiplying fractions by
 whole numbers with, 107
fractions,
 as ratios, 265, 266
 dividing into whole numbers,
 129–132
 division of, 135–138
 equations involving, 333–335
 in math problems, 147–150
 in mixed numbers, 121–124
 multiplication models for,
 110–112
 multiplying as factors, 115–118
 multiplying by whole numbers,
 104–107
 order of operations for, 153, 154
 relating to decimals and
 percents, 234–238, 242–245,
 248–252, 282, 283

G

Game:
 Empty the Rectangles, 416
 Fitting In, 28
 Largest Box Problem, 201
 Make the Number, 349
 Spinning Fractions, 127

Target Tessellations, 470
Triple Play, 278
What's My Product?, 76
geometry software,
 creating tessellations with, 479
 viewing objects with, 440
goods and services tax (GST),
 256–259
graphs, 382–386
 constructing with spreadsheet
 software, 366, 367, 391, 392
 finding unit rates with, 296
 for linear relations, 352, 359–362
 formatting on spreadsheet
 software, 403, 404
greatest common factor, 271
grouping symbol, 85, 91
grouping terms, 90

H

harmonized sales tax (HST) (*see*
 sales tax)
hexagon, 463
hexagonal pyramid, 171
horizontal rotation, 441–444
hundredths chart for
 representing percents with,
 235, 244
hypotenuse, 31–33, 46–48
hypothesis, 314 *Unit Problem*

I

improper fractions, 122, 143, 144
independent events,
 probability of, 408–410
 solving problems with, 417–419
integers,
 division models of, 77–80
 division rules for, 84–86
 multiplication models of,
 64–67
 multiplication rules for, 70–72
 order of operations with, 90, 91
interactive isometric drawing
 tool, 454
inverse operations, 12, 129
isometric, 435
isometric drawing, 435, 436
isosceles right triangle, 31

L

legs, 31–33, 46–48
length of a line segment, 17–19
line graph, 383
 constructing with spreadsheet
 software, 391
 formatting on spreadsheet
 software, 404

 misrepresented data on, 397, 398
line segment measurements, 17–19
linear relations,
 creating tables of values for,
 352–355
 graphing, 359–362
 graphing with spreadsheet
 software, 366, 367
linking cubes,
 building objects from their
 views, 447–449
 viewing objects with, 435, 436,
 440
 viewing rotated objects with,
 442–444
 viewing with an interactive
 isometric drawing tool, 454

M

Math Link:
 Art, 453
 History, 42, 214
 Science, 358
 Sports, 67
 Your World, 134, 301, 422
misrepresented data, 394–398
mixed numbers,
 dividing, 141–144
 multiplying, 121–124
multiplication,
 dividing fractions with, 136, 137
 dividing mixed numbers with,
 143
multiplication equations, 105, 136
multiplicative identity, 71

N

negative integers, 64–67, 71, 72,
 77–80, 84–86, 94, 95
nets, 170–173
 creating objects from, 177–179
 of a rectangular prism, 182–185
 of a triangular prism, 188
number line,
 dividing fractions by fractions
 with, 135, 138
 dividing integers with, 78, 79
 dividing mixed numbers with,
 142
 dividing whole numbers by
 fractions (and vice versa)
 with, 130, 131
 estimating square roots with, 24
 multiplying fractions by
 whole numbers with, 105, 106
 multiplying integers with, 64, 67
 showing percents on, 243–245,
 249–252

O

objects,
 building from their views,
 447–449
 identifying transformations in
 tessellations, 471, 475
 rotated views of, 441–444
 sketching views of, 434–437
 sketching with geometry
 software, 440
 tessellations of, 462–467
 transformations of, 456–459
 viewing with an interactive
 isometric drawing tool, 454
obtuse triangle, 39, 40, 464
octagonal pyramid, 179
order of operations, 90, 91
 for expressions as a fraction, 91
 with fractions, 153, 154
ordered pair, 353, 355
outcomes, 407–410, 417–419

P

palindromic number, 16 *Practice*
part-to-part ratio, 265, 266, 281
part-to-whole ratio, 265, 266, 282,
 283
Pattern Blocks,
 multiplying fractions with, 111
pentagonal prism, 171
percent decrease, 251, 252
percent increase, 251
percents,
 as ratios, 265, 266
 calculating sales taxes in,
 256–259
 comparing ratios with, 282, 283
 relating to decimals and
 fractions, 234–238, 242–245,
 248–252, 282, 283
perfect square (*see* square
 numbers)
perimeter,
 of a square, 7, 24
phonograph cylinder, 214
Math Link
pictograph, 384, 385
 comparing ratios with, 280
 finding unit rates with, 295
 misrepresented data on, 396
 multiplying fractions by
 whole numbers with, 105
pie charts, 392
plane, 462–467
plus/minus statistics, 67
Math Link
polygons, 171, 179
 tessellations of, 463

polyhedron, 171, 179
 positive integers, 64–67, 71, 72,
 77–80, 84–86, 94, 95
 power of 10, 235
 pressure, 358 *Math Link*
 prisms, 434
 nets of, 171–173
 surface area of, 183–185,
 188–190, 209–211
 volume of, 195–197, 202–204,
 215–217
 probability,
 of independent events, 407–410,
 417–419
 simulated on a Web site virtual
 manipulative, 423
 proper fractions, 113 *Practice*, 122
 proportion, 287–290
 provincial sales tax (PST), 256–259
 pyramid, 171
 Pythagoras, 32
 Pythagorean Theorem, 4, 31–33,
 39–42, 46–48
 verifying with geometry
 software, 37, 38
 Pythagorean triple, 41, 42

Q

quadrilateral, 6
 tessellation of, 464
 quotient, 12, 77, 85

R

rates, 294–297, 300–303
 ratios, 264–266
 comparing, 279–283
 equivalent, 269–273, 288–290
 solving math problems with,
 287–290
 rectangle, 6
 area of, 105
 multiplying fractions with
 models of, 112
 multiplying mixed numbers
 with models of, 122, 123
 tessellation of, 466, 467
 rectangular prism, 434
 surface area of, 183–185
 volume of, 195–197
 reflection, 457, 458, 472, 473
 regular dodecagon, 175 *Practice*
 regular hexagonal pyramid, 179
 regular polygon, 171
 regular pyramid, 171
 remainders, 131, 132, 138
 repeated addition, 64, 65, 105
 repeating decimal, 237
 rhombus,
 transformations in, 473

right angles, 6
 right cylinders, 171
 right prisms, 171
 right triangle, 31–33, 37, 38, 40
 rotation, 441–444, 457–459, 473

S

sale price, 257–259
 sales tax, 256–259
 scalene right triangle, 31
 scatter plot, 367
 selling price, 257–259
 side length of a square, 17, 22–24,
 47, 48
 Sierpinski Triangle, 164 *Unit
 Problem*
 simplest form, 235, 236, 271
 of a product, 123
 simulation, 490 *Investigation*
 speed, 294, 296, 297
 spreadsheet software,
 constructing graphs with, 391,
 392
 formatting graphs on, 403,
 404
 graphing linear relations with,
 366, 367
 square, 6
 area of, 17–19, 22–24, 40, 41, 47,
 48
 side length of, 17, 22–24, 47, 48
 square brackets, 90, 91
 square dot paper, 435
 square numbers (*also* perfect
 square), 6, 7, 11–14
 square prism, 171, 172
 square pyramid, 179
 square roots, 12–14
 as decimals, 22–24
 estimating, 22–24
 investigating with calculators, 29
 square units, 13, 18, 19, 23
 surface area,
 of a cylinder, 209–211
 of a rectangular prism, 183–185
 of a triangular prism, 188–190

T

tables,
 constructing with spreadsheet
 software, 366, 367
 creating values of linear relations
 in, 351–355
 finding unit rates with, 296
 tessellate, 463–467
 tessellations, 462–467
 creating with geometry
 software, 479
 transformations in, 471–475

tetrahedron, 171
 Theodorus, 36 *Practice*
 theoretical probability, 423
 three-term ratio, 265, 266
 “Traffic Light” strategy, 157
 transformation, 456–459
 in tessellations, 471–475
 translation, 457, 458, 473
 tree diagram, 409, 418
 triangle,
 area of, 18
 creating tessellations with
 geometry software, 479
 tessellation of, 464, 472
 triangular prism, 172, 179
 surface area of, 188–190
 volume of, 202–204
 triangular pyramid, 171
 two-term ratio, 265, 266

U

unit rates, 295–297, 301–303

V

variables, 318–323, 328–330, 334,
 335, 361, 362
 in writing formulas, 196, 203
 vertex of a net, 171
 vertical rotation, 441–444
 volume,
 of a cylinder, 215–217
 of a rectangular prism, 195–197
 of a triangular prism, 202–204

W

Web site virtual manipulatives,
 simulating probability on, 423
 Wheel of Theodorus, 36 *Practice*
 whole numbers,
 dividing by fractions, 129–132
 multiplying by fractions, 104–107
 order of operations, 90
 properties of, 71
 word problems,
 key word operations in, 148–150

Z

zero pairs, 66, 322, 323
 zero property, 71
 zero value, 77

Acknowledgments

Pearson Education would like to thank the Bank of Canada and the Royal Canadian Mint for the illustrative use of Canadian bills and coins in this textbook. In addition, the publisher wishes to thank the following sources for photographs, illustrations, and other materials used in this book. Care has been taken to determine and locate ownership of copyright material in this text. We will gladly receive information enabling us to rectify any errors or omissions in credits.

Photography

Cover: John Guistina/Imagestate/firstlight.ca
p. 3 Ian Crysler; p. 4 (top) Arthur S. Aubry/Photodisc Collection/Getty Images;
p. 4 (centre) bridge Corel Collection Southwestern U.S.; p. 5 (top left) Royalty-Free/CORBIS; p. 5 (top right) Martin Bond/Photo Researchers, Inc.; p. 5 (bottom) Vision/Cordelli/Digital Vision; p. 8 Ian Crysler; p. 10 Linda Bucklin/Shutterstock;
p. 11 Ian Crysler; p. 17 Ian Crysler; p. 22 Ray Boudreau; p. 26 Angela Wyant/Stone/Getty Images; p. 32 SEF/Art Resource N.Y.; p. 38 Creatas/First Light;
p. 50 Burke/Triolo/Brand X/Getty Images; p. 51 Clifford Skarstedt/CP Photo; p. 56 Jeff Greenberg/Photo Edit; pp. 62–63 (top) Corel Collections, *Lakes and Rivers*; p. 62 (top) imagesource/firstlight.ca; p. 63 (middle left) Reuters/CORBIS; p. 63 (middle right) Canadian Press/Jonathan Hayward; p. 63 (bottom) Lawson Wood/CORBIS; pp. 76–77 Ian Crysler; p. 79 Al Grillo/CP Photo; p. 81 Steve Kaufman/A.G.E. fotostock/First Light;
p. 84 Ian Crysler; p. 86 DreamPictures/Stone/Getty Images; p. 88 Sandy Grant/CP Photo; p. 89 Ron Hofman/White Rainbow Photography; p. 99 Stewart Cohen/Pam Ostrow/Getty Images; p. 100 Ray Boudreau; p. 104 Ian Crysler; p. 109 Larry Macdougall/First Light; p. 110 Ian Crysler; p. 118 B&Y Photography/Alamy; p. 121 Ian Crysler; p. 134 Wendell Webber/FoodPix/Jupiter Images; p. 141 Ian Crysler; p. 147 Keith Levit/Alamy; p. 151 Blend Images/Alamy; p. 152 The Stock Asylum, LLC/Alamy; p. 153 Jeff Greenberg/Alamy; pp. 168–169 CD case Photodisc; Timberland® shoes Cindy Charles/Photo Edit Inc.; golf balls Bill Ivy/Ivy Images; tennis balls Danilo Calilung/Corbis; all others Ian Crysler; p. 170 Ian Crysler; p. 175 Courtesy of Jason Taylor; p. 176 (top) Andy Crawford/Dorling Kindersley; p. 176 (bottom) Klaus Hackenberg/zefa/Corbis; p. 177 Michael Newman/Photo Edit; p. 181 Jules Frazier; p. 183 Ian Crysler; p. 188 Ian Crysler; p. 195 Ian Crysler; p. 199 Graham Tomlin/Shutterstock; p. 206 Prentice Hall, Inc.; p. 209 Ray Boudreau; p. 213 (left) Katherine Fawssett/The Image Bank/Getty Images; p. 213 (right) ME967X.45, McCord Museum, Montreal; p. 214 Terrence Mendoza/Shutterstock; p. 215 Ian Crysler; p. 217 Reuters/CORBIS; p. 228 (left) BYPhoto/Alamy; p. 228 (centre) Bill Brooks/Alamy; p. 228 (right) Hemera/Photo.com/Jupiter Images; p. 229 Ian Crysler; p. 231 Ray Boudreau; p. 232 Dorling Kindersley Media Library; p. 233 (top to bottom) Dorling Kindersley Media Library; Noella Ballenger/Alamy; Photodisc/Getty Images; Don Mason/CORBIS/MAGMA; p. 248 Ian Crysler; p. 251 Aaron Haupt/

Photoresearchers/First Light; p. 253 Courtesy of Rayven Moon; p. 254 Rubens Abbound/Alamy; p. 256 Ian Crysler; p. 261 Alaska Stock LLC/Alamy; p. 262 Photo Objects.Net Images/Jupiter Unlimited; p. 274 Canadian Press/Don Denton; p. 279 Ian Crysler; p. 282 BlueMoon Stock/Alamy; p. 286 Johner/Getty Images; p. 287 Image Source Pink/Jupiter Images; p. 290 Photodisc Collection/Getty Images; p. 293 Tony Freeman/Photo Edit; p. 294 (top) Michael Probst/CP Photo; p. 294 (centre) luri/Shutterstock; p. 294 (bottom) Ian Crysler; p. 297 (top) Tim O'Hara/Corbis; p. 297 (bottom) Jack Cox – Images of Nature/Alamy; p. 298 Larry MacDougal/CP Photo; p. 301 Photodisc/First Light; p. 304 Courtesy of BC Curios Ltd.; p. 308 (left) Ken Gigliotti/CP Photo; p. 308 (right) Kitch Bain/Alamy; p. 310 Natalie Fobes/CORBIS; p. 311 Flip Nicklin/Minden Pictures/Getty Images; p. 314 (top) Vlade Shestakov/Shutterstock; p. 314 (centre) Eric Gevaert/Shutterstock; p. 314 (bottom) Geri Lavrov/Lifesize/Shutterstock; p. 316 (top) Royalty-Free/CORBIS; p. 316 (bottom) Shutterstock; p. 317 (top) Bernd Fuchs/firstlight.ca; p. 317 (bottom) Courtesy of Raf Komierowski; p. 318 Ian Crysler; p. 327 Jonathan Hayward/CP Photo; p. 332 Chuck Savage/CORBIS; p. 338 John Connell/Index Stock Imagery; p. 344 Ian Crysler; p. 345 Paul Felix Photography/Alamy; p. 347 Courtesy of Diana Mej; p. 353 Sergey Shandin/Shutterstock; p. 365 Ryan McVey/Stone/Getty Images; p. 367 Brian Bailey/Taxi/Getty Images; p. 376 isifa Image Service s.r.o./Alamy; pp. 380–381 Ian Crysler; p. 393 Digital Vision; p. 416 Ian Crysler; p. 418 Richard l'Anson/Lonely Planet Images/Getty Images; p. 420 Graca Victoria/Shutterstock; p. 421 Stockbyte/Getty Images; p. 422 Loreda Rucchin/iStockphoto; pp. 430–431 Ian Crysler; pp. 432–433 Courtesy of Don Yeomans; p. 433 (top) "The Benefit" Courtesy of Don Yeomans; p. 433 (bottom) "Gunarh and the Whale" Courtesy of Don Yeomans; p. 434–436 Ian Crysler; p. 437 (top) Ian Crysler; p. 437 (bottom) Ray Boudreau; p. 438 (top) Ray Boudreau; p. 438 (bottom) Masterfile Royalty-Free; p. 439 (top) AbleStock.com Images/Jupiter Unlimited; p. 439 (centre) Hemera/MaXx Images; p. 439 (bottom) Masterfile Royalty-Free; p. 440 Ray Boudreau; pp. 441–442 Ian Crysler; p. 443 (top) Ray Boudreau; p. 443 (middle) Ian Crysler; p. 444 (top, middle) Ian Crysler; p. 444 (bottom) Ray Boudreau; p. 445 Ray Boudreau; p. 446 Ian Crysler; pp. 448–450 Ian Crysler; p. 453 Courtesy of IMAX Corporation; p. 455 (top) Ronen/Shutterstock; p. 455 (centre) Ray Boudreau; p. 455 (bottom) Ian Crysler; p. 461 "Haida Frog" by Bill Reid, courtesy of Martine Reid; p. 462 (left) Ryan McVay/Photodisc/Getty Images; p. 462 (left inner) Brigitte Sporrer/zefa/Corbis; p. 462 (centre) Peter Baxter/Shutterstock; p. 462 (right inner) oksanaperkins/Shutterstock; p. 462 (right) nolie/Shutterstock; p. 471 Ian Crysler; p. 477 (left) Courtesy of M.C. Escher Company; p. 477 (right) Bonnie Kamin/Photo Edit; p. 478 Philip and Karen Smith/Photodisc/Getty Images; pp. 482–484 Ian Crysler; p. 485 (top) Roman Soumar/CORBIS; p. 485 (bottom) M.C. Escher's Reptiles © 2004 The M.C. Escher Company–Baarn, Holland. All Rights Reserved; p. 488 M.C. Escher's Fish © 2004 The M.C. Escher Company–Baarn, Holland. All Rights Reserved; pp. 489–490 Ian Crysler

Illustrations

Steve Attoe, Pierre Berthiaume, Philippe Germain, Brian Hughes, Paul McCusker, Dusan Petrić, Michel Rabagliati, Neil Stewart/NSV Productions, Craig Terlson

Pearson
Mathematics
Makes Sense

Lorraine Baron

Trevor Brown

Garry Davis

Sharon Jeroski

Susan Ludwig

Elizabeth Milne

Kanwal Neel

John Pusic

Robert Sidley

David Sufrin

Michael Davis

Craig Featherstone

Marc Garneau

Cathy Heideman

Jason Johnston

Don Jones

A. J. Keene

Bryn Keyes

Georgia Konis-Chatzis

Antonieta Lenjosek

Peggy Morrow

Carole Saundry

Margaret Sinclair

Elizabeth A. Wood



www.pearsoned.ca

ISBN-13: 978-0-321-49651-5

ISBN-10: 0-321-49651-5

