Glossary

**acute angle**: an angle between $0^\circ$ and $90^\circ$

**acute triangle**: a triangle where all angles are less than $90^\circ$

**amortization period**: the length of time over which a loan is paid off

**amortization table**: a detailed outline showing how much of each equal payment repays interest and principal and the loan balance after each payment

**amount of an annuity**: the ending balance after a designated amount of time; it is the principal plus interest; see future value

**angle of depression**: the angle between the horizontal and a sightline to a point below eye level

**angle of elevation**: the angle between the horizontal and a sightline to a point above eye level

**angle of inclination**: see angle of elevation

**annuity**: a series of regular, equal payments paid into, or out of, an account

**area**: the number of square units needed to cover a surface; common units used to measure area include square centimetres and square metres

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

**balance**: for a budget, the difference when total expenses are subtracted from total income. Adjusting the balance so that expenses meet income is called balancing the budget.

**bar graph**: a graph that displays data using horizontal or vertical bars whose lengths are proportional to the numbers they represent

**base**: the side of a polygon, or the face of a solid or object, from which the height is measured; also, in an expression of the form $b^n$, $b$ is the base; see exponent, power

**base value**: for an index, a set value used for comparisons across the index

**bearing**: the angle describing an object’s position as measured clockwise from North, usually expressed using 3 digits

**bias**: an emphasis on characteristics that are not typical of the entire population

**budget**: a written plan to outline how money will be spent
capacity: the measure of how much liquid a container can hold. It can be measured in imperial or metric units. Imperial measures of capacity include fluid ounces (fl. oz.), pints (pt.), quarts (qt.), and gallons (gal.)
categorical data: data that are grouped by categories
census: the collection of data about every individual in a population
circle: the set of points in a plane that are a given distance (the radius) from a fixed point (the centre)
circle graph: a diagram that uses parts of a circle to display data, sometimes called a pie chart

Favourite Colours of People in My Class

- Purple 10%
- Yellow 5%
- Green 14%
- Blue 28%
- Black 24%
- Red 19%

congruent: having the same size and shape, but not necessarily the same orientation
constraint: a condition that limits or restricts options
convenience sampling: sampling in which individuals who are easy to sample are chosen
coordinate axes: the horizontal and vertical number lines on a grid that represents a plane

compound interest: interest earned via a method of calculating interest in which the interest due is added to the principal and thereafter earns interest; calculated using the formula \( A = P(1 + i)^n \), where \( A \) is the amount of the compound interest, \( P \) is the principal, \( i \) is the interest rate per compounding period as a decimal, \( n \) is the number of compounding periods
concept map: a graphic organizer that illustrates the connections among different terms or concepts

cone: a solid that is formed by a region (base of the cone) and all the line segments joining points in the base to a point not in the base
coordinates: also called Cartesian coordinates; the numbers in an ordered pair that locate a point in the coordinate plane
correlation: the strength of a linear relationship between two variables
correlation coefficient, \( r \): a measure, between \(-1 \) and \( 1 \), of how closely data can be described by a certain type of function; the closer the value of \( r \) to \( 1 \) or \( -1 \), the more closely the data fits the function
cosine: for an acute \( \angle A \) in a right triangle, the ratio of the length of the side adjacent to \( \angle A \), to the length of the hypotenuse; written \( \cos A \)
\[
\cos A = \frac{\text{length of side adjacent to } \angle A}{\text{length of hypotenuse}}
\]

Cosine Law: In any \( \triangle ABC \),
\[
c^2 = a^2 + b^2 - 2ab \cos C
\]
This can also be written as: \( \cos C = \frac{a^2 + b^2 - c^2}{2ab} \)
cube: a rectangular prism whose length, width, and height are all equal; see rectangular prism
cube number: a power with exponent 3; for example, 8 is a cube number because \( 2^3 = 8 \)
cube root: a number which, when raised to the power 3, results in a given number; for example, 3 is the cube root of 27, and \(-3 \) is the cube root of \(-27 \)
curve of best fit: for a given scatter plot, the curve that passes most closely to the majority of points; the curve of best fit can be obtained by exponential or quadratic regression
cylinder: a solid with two parallel, congruent, circular bases
equilateral triangle: a triangle with three equal sides; each angle is \( 60^\circ \)
exponential equation: an equation in the form \( y = ab^x \); \( a \) is the initial value; \( b \) is the growth or decay factor
exponential regression: the process of identifying an exponential curve of best fit for a given set of data
expression: a meaningful mathematical phrase made up of numbers and/or variables which may include operation symbols
extrapolate: to estimate a value that lies beyond the known values
face: a flat surface of a 3-dimensional object
expenses: items that must be paid from income; for example, food, shelter, transportation
exponent: in an expression of the form \( b^n \), \( n \) is the exponent; exponents that are positive integers indicate the number of times a factor is repeated in a product; for example, in \( 3^4 \), the exponent 4 indicates that the base 3 is used as a factor 4 times; see base, power
**formula:** a rule that is expressed as a mathematical equation that relates two or more variables

**Frayer model:** a graphic organizer with 4 sections which can hold a definition, characteristics or facts, examples, and non-examples of a word or a concept

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**Function:** a rule that gives a single output number for each input number

**Future value:** the principal and interest due when an investment matures; also referred to as amount

\[ \text{Amount} = \text{Principal} + \text{Interest}, \quad A = P + I \]

**Horizontal intercept:** the horizontal coordinate of a point where the graph of a relation intersects the horizontal axis

**Hypotenuse:** the side opposite the right angle in a right triangle

**Income:** the money you earn

**Income tax:** money paid as tax to the federal and provincial governments based on the amount of income earned

**Index:** a comparative set of data used to track trends or establish guidelines for a given situation; each value may be given as a percent of the base value (as in a stock index); or calculated using a formula (as in the body mass index)

**Inflation:** the continuing rise in the general price of all goods and services; it is usually attributed to an increase in the volume of money and credit relative to available goods and services

**Interest:** the fee paid by a borrower for the use of a lender’s money

**Interest rate:** the amount earned or paid for the use of money; usually given as a percent of the amount invested or borrowed per year

**Interpolate:** to estimate a value between two known values

**Inverse operation:** an operation that reverses another operation

**Inverse ratios:** \( \sin^{-1}, \cos^{-1}, \) and \( \tan^{-1} \) which are used to determine the measure of an angle when its trigonometric ratio is known

**Judgement sampling:** sampling in which the person doing the sampling uses her or his judgement to create a representative sample

**Landlord:** the owner of a property. He/she receives compensation from the tenant for use of his/her property.

**Lease:** to rent an item from the owner; the lease payments cover the depreciation of the item over the course of the lease plus interest on the outstanding balance of the full purchase price
line of best fit: a line that passes as close as possible to a set of plotted points

linear correlation: a trend where points may lie in the general direction of a line

linear regression: the process of identifying a line of best fit for a set of data

margin of error: the proportion that we add to and subtract from a result to create a range of possible values between which the result could lie

mass: a measure of the amount of material in an object; common units are grams or kilograms

matrix: a graphic organizer used to list and compare characteristics of different items

mean: one measure of the average of a set of numbers; to find the mean, divide the sum of the data by the number of data

measure of central tendency: the mean, median, or mode of a data set

median: the middle number of a set of data arranged in numerical order; if there are two middle numbers, the median is their average

mode: the most frequently occurring value in a set of data

mortgage: a long-term loan on real estate that gives the person or firm providing the money a claim on the property if the loan is not repaid

numeric data: data that always involve numbers

oblique angle: an angle that is not a multiple of 90°

oblique triangle: a triangle that does not contain a 90° angle

obtuse angle: an angle between 90° and 180°

obtuse triangle: a triangle with one obtuse angle

one-variable data: a set of data that describes one attribute per item in a sample

optimization: the process of finding the most efficient use of available materials within given constraints

ordered pair: a pair of numbers, written as \((x, y)\), that represents a point on the coordinate plane; see coordinates

ordinary simple annuity: an annuity in which payments are made and interest is compounded with the same frequency; see annuity

outlier: an observed value that differs markedly from the pattern established by most data in a set

parabola: the graph of a quadratic relation; see quadratic regression

parallel: describing lines lying on the same plane that do not intersect

parallelogram: a quadrilateral with opposite sides parallel

percentile: tells approximately what percent of the data are less than a particular data value

perimeter: the distance around a closed figure

perpendicular: intersecting at right angles (90°)
pi (π): the ratio of the circumference of a circle to its diameter; \( \pi \approx 3.1416 \)

poll: a survey or an investigation of a topic to find out people’s views

polygon: a closed figure that consists of line segments that only intersect at their endpoints

population: the set of all things or people being considered

power: an expression of the form \( b^n \), where \( b \) is the base and \( n \) is the exponent; for positive integer exponents, powers are a shortcut for repeated multiplication – for example, \((-4)^3 = (-4) \times (-4) \times (-4)\); see base, exponent

present value: the principal that must be invested today to obtain a given amount in the future; compare to future value

present value of an annuity: the principal that must be invested today to provide the regular payments of an annuity

primary trigonometric ratios: sine, cosine, and tangent

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

principal: the sum of money invested or borrowed

prism: a solid with two congruent and parallel faces (bases); all other faces are parallelograms

pyramid: a solid with one face that is a polygon (the base) and the other faces that are triangles with a common vertex

Pythagorean Theorem: 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 other two sides; \( a^2 + b^2 = c^2 \)

quadrants: one of the four regions into which the coordinate axes divide the plane

quadratic regression: a process of identifying the parabola of best fit for a given set of data

quadrilateral: a polygon with four sides

quartile: any of three numbers that separate a sorted data set into four equal parts

radical form: a number written using the root symbol: \( \sqrt[n]{ \text{ } } \), where \( n = 2, 3, \ldots \)

rate: a certain quantity or amount of one thing considered in relation to a unit of another thing

property tax: an amount that property owners pay to their municipal government
rate of change: the rate at which something is changing; it is often indicated by the slope of a graph

total change: the rate at which something is changing; it is often indicated by the slope of a graph

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

rectangle: a quadrilateral with four right angles

rectangular prism: a prism with rectangular faces; see prism

regression: the process of identifying a curve or a line of best fit for a set of data

representative sample: a sample which in certain respects is typical of the population from which it is chosen

rhombus: a parallelogram with four equal sides

right angle: a 90° angle

right triangle: a triangle with one right angle

root of a number: the nth root of a number is a number which, when n copies of the number are multiplied, results in a given number; for example, 3 is a cube root of 27

sampling technique: the process used to select the individuals from a population who will be studied; see cluster sampling, convenience sampling, judgement sampling, simple random sampling, stratified sampling, systematic sampling, voluntary sampling

savings: money set aside for future use; in a budget, it is shown as an expense

scatter plot: a graph of data that are a series of points

height (cm) 154 162 172 178
mass (kg) 56.3 60.1 72.2 64.3

sightline: the line from an observer’s eye to a specific object

simple interest: interest earned only on the principal, calculated using the formula \( I = Prt \), where \( I \) is the simple interest, \( P \) is the principal, \( r \) is the annual interest rate as a decimal, \( t \) is the time in years; compare to compound interest

simple random sampling: sampling in which individuals are chosen randomly from the entire population

sine: for an acute \( \angle A \) in a right triangle, the ratio of the length of the side opposite \( \angle A \), to the length of the hypotenuse; written \( \sin A = \frac{\text{length of side opposite } \angle A}{\text{length of hypotenuse}} \)

Sine Law: In any \( \triangle ABC \),

\[
\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} \text{ and } \frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}
\]

slope: a measure of the steepness of a line; calculated as slope = \( \frac{\text{rise}}{\text{run}} \)

solve a triangle: to determine the measures of all unknown sides and angles in a triangle

sphere: the set of points in space that are a given distance (the radius) from a fixed point (the centre)
**square**: a rectangle with four equal sides

**square of a number**: the product of a number multiplied by itself; a number to the power of 2

**square root**: a number which, when multiplied by itself, results in a given number; for example, 5 and −5 are the square roots of 25

**stratified sampling**: sampling in which data are grouped and a few individuals from each group are selected randomly

**supplementary angles**: 2 angles whose sum is 180°

**surface area**: the measure of the area of all the faces of an object

**systematic sampling**: sampling in which every nth individual is selected

**tangent**: for an acute \( \angle A \) in a right triangle, the ratio of the length of the side opposite \( \angle A \), to the length of the side adjacent to \( \angle A \); written \( \tan A \)

\[
\tan A = \frac{\text{length of side opposite } \angle A}{\text{length of side adjacent to } \angle A}
\]

**tenant**: the user of a property owned by another person; he/she pays the landlord for use of the property

**torus**: an object shaped like a doughnut

**trends**: patterns of change; trends are often used to justify decisions and make predictions

**triangle**: a polygon with three sides

**triangular prism**: a prism with triangular bases, see prism

**trigonometric ratios**: see cosine, sine, and tangent

**two-variable data**: a set of data that gives measures of two attributes for each item in a sample

**utilities**: services such as heat, water, and electricity

**valid conclusion**: a conclusion that is supported by unbiased data that has been interpreted appropriately

**variable**: a letter or symbol used to represent a quantity that can vary

**variable cost**: operating costs that change depending on variables; compare to fixed cost

**Venn diagram**: a graphical organizer with loops that group items to show similarities and differences

**vertical intercept**: the vertical coordinate of a point where the graph of a relation intersects the vertical axis

**volume**: the amount of space occupied by an object; measured in cubic units

**voluntary sampling**: sampling in which participants volunteer to be included in the sample

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

**x-intercept**: the x-coordinate of a point where a graph intersects the x-axis; see horizontal intercept

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

**y-intercept**: the y-coordinate of a point where a graph intersects the y-axis; see vertical intercept