Glossary

A

amortization table: A table that lists regular payments of a loan and shows how much of each payment goes toward the interest charged and the principal borrowed, as the balance of the loan is reduced to zero.

amplitude: The distance from the midline to either the maximum or minimum value of a periodic function; the amplitude is always expressed as a positive number.

appreciation: Increase in the value of an asset over time.

asset: An item or a portion of an item owned; also known as property. Assets include such items as real estate, investment portfolios, vehicles, art, and gems.

B

Bank of Canada prime rate: A value set by Canada's central bank, which other financial institutions use to set their interest rates.

biconditional: A conditional statement whose converse is also true; in logic notation, a conditional statement is written as "p if and only if q."

For example, the statement "If a number is even, then it is divisible by 2" is true. The converse, "If a number is divisible by 2, then it is even," is also true. The biconditional statement is "A number is even if and only if it is divisible by 2."

C

collateral: An asset that is held as security against the repayment of a loan.

combination: A grouping of objects where order does not matter. For example, the two objects a and b have one combination because ab is the same as ba.

complement: All the elements of a universal set that do not belong to a subset of it; for example, $O' = \{0, 2, 4, 6, 8\}$ is the complement of $O = \{1, 3, 5, 7, 9\}$, a subset of the universal set of digits, D. The complement is denoted with a prime sign, O'.

compound interest: The interest that is earned or paid on both the principal and the accumulated interest.

compounded annually: When compound interest is determined or paid yearly.

compounding period: The time over which interest is determined; interest can be compounded annually, semi-annually (every 6 months), quarterly (every 3 months), monthly, weekly, or daily.

conclusion: The result of a hypothesis; for example, in the statement "If it is Monday, then it is a school day," the conclusion is "it is a school day."

conditional probability: The probability of an event occurring given that another event has already occurred.

conditional statement: An "if–then" statement; for example, "If it is Monday, then it is a school day."

constant term: The constant term in a polynomial function in standard form is the term that does not have a variable. For example, in this function, the constant term is -5.

$$f(x) = 2x^2 + 7x - 5$$

contrapositive: A statement that is formed by negating both the hypothesis and the conclusion of the converse of a conditional statement; for example, for the statement "If a number is even, then it is divisible by 2," the contrapositive is "If a number is not divisible by 2, then it is not even."

converse: A conditional statement in which the hypothesis and the conclusion are switched; for example, the converse of "If it is Monday, then it is a school day" is "If it is a school day, then it is Monday."

counterexample: An example that disproves a statement; for example, "If it is Monday, then it is a school day" is disproved by the counterexample that there is no school on Thanksgiving Monday. Only one counterexample is needed to disprove a statement.

cubic function: A polynomial function of the third degree, whose greatest exponent is three; for example,

$$f(x) = 5x^3 + x^2 - 4x + 1$$

curve of best fit: A curve that best approximates the trend on a scatter plot.

D

dependent events: Events whose outcomes are affected by each other; for example, if two cards are drawn from a deck without replacement, the outcome of the second event depends on the outcome of the first event (the first card drawn).

depreciation: Decrease in the value of an asset over time.

disjoint: Two or more sets having no elements in common; for example, the set of even numbers and the set of odd numbers are disjoint.

disposable income: The amount of income that someone has available to spend after all regular expenses and taxes have been deducted.

E

element: An object in a set; for example, 3 is an element of D, the set of digits.

empty set: A set with no elements; for example, the set of odd numbers divisible by 2 is the empty set. The empty set is denoted by { } or $\varnothing$.

end behaviour: The description of the shape of the graph, from left to right, on the coordinate plane.

equity: The difference between the value of an item and the amount still owing on it; can be thought of as the portion owned. For example, if a $25 000 down payment is made on a $230 000 home, $205 000 is still owing and $25 000 is the equity or portion owned.

exponential function: A function of the form

$$y = a(b)^x$$

where $a \neq 0$, $b > 0$, and $b \neq 1$.

exponential decay function: An exponential function whose y-values decrease as you move from left to right along the x-axis; for an exponential function of the form $y = a(b)^x$, exponential decay occurs when $a > 0$ and $0 < b < 1$.

exponential growth function: An exponential function whose y-values increase as you move from left to right along the x-axis; for an exponential function of the form $y = a(b)^x$, exponential growth occurs when $a > 0$ and $b > 1$.

extrapolation: The process used to estimate a value outside the domain of a set of data, based on a trend.

F

factorial notation: A concise representation of the product of consecutive descending natural numbers:

$$n! = n(n - 1)(n - 2)\ldots(3)(2)(1)$$

For example:

$$4! = 4 \cdot 3 \cdot 2 \cdot 1$$

fair game: A game in which all the players are equally likely to win; for example, tossing a coin to get heads or tails is a fair game.

finite set: A set with a countable number of elements; for example, the set of even numbers less than 10, $E = \{2, 4, 6, 8\}$, is finite.

fixed interest rate: An interest rate that is guaranteed not to change during the term of an investment or loan.

frequency: The number of times that a cycle occurs in a given time period. For example, the fourth A note on a piano has a frequency of 440 Hz or 440 cycles per second.

Fundamental Counting Principle: If there are a ways to perform one task and b ways to perform another, then there are $a \cdot b$ ways of performing both.

future value: The amount, A, that an investment will be worth after a specified period of time.

H

hypothesis: An assumption; for example, in the statement "If it is Monday, then it is a school day," the hypothesis is "It is Monday."

I

infinite set: A set with an infinite number of elements; for example, the set of natural numbers, $N = \{1, 2, 3, \ldots\}$, is infinite.

interest: The amount of money earned on an investment or paid on a loan.

interpolation: The process used to estimate a value within the domain of a set of data, based on a trend.

intersection: The set of elements that are common to two or more sets. In set notation, $A \cap B$ denotes the intersection of sets A and B; for example, if $A = \{1, 2, 3\}$ and $B = \{3, 4, 5\}$, then $A \cap B = \{3\}$.

inverse: A statement that is formed by negating both the hypothesis and the conclusion of a conditional statement; for example, for the statement "If a number is even, then it is divisible by 2," the inverse is "If a number is not even, then it is not divisible by 2."

L

leading coefficient: The coefficient of the term with the greatest degree in a polynomial function in standard form; for example, the leading coefficient is 2 in the function

$$f(x) = 2x^3 + 7x$$

lease: A contract for purchasing the use of property, such as a building or vehicle, from another, the lessor, for a specified period.

line of best fit: A straight line that best approximates the trend in a scatter plot.

line of credit: A pre-approved loan that offers immediate access to funds, up to a pre-defined limit, with a minimum monthly payment based on accumulated interest; a secure line of credit has a lower interest rate because it is guaranteed against the client's assets, usually property.

logarithmic function: A function of the form

$$y = a \log_b x$$

where $b > 0$ and $b \neq 1$, $a \neq 0$, and a and b are real numbers.

M

maturity: The contracted end date of an investment or loan, at the end of the term.

midline: The horizontal line halfway between the maximum and minimum values of a periodic function.

mortgage: A loan usually for the purchase of real estate, with the real estate purchased used as collateral to secure the loan.

mutually exclusive: Two or more events that cannot occur at the same time; for example, the Sun rising and the Sun setting are mutually exclusive events.

O

odds against: The ratio of the probability that an event will not occur to the probability that the event will occur, or the ratio of the number of unfavourable outcomes to the number of favourable outcomes.

odds in favour: The ratio of the probability that an event will occur to the probability that the event will not occur, or the ratio of the number of favourable outcomes to the number of unfavourable outcomes.

P

period: The length of the interval of the domain to complete one cycle.

periodic function: A function whose graph repeats in regular intervals or cycles.

permutation: An arrangement of distinguishable objects in a definite order. For example, the objects a and b have two permutations, ab and ba.

polynomial function: A function that contains only the operations of multiplication and addition with real-number coefficients, whole-number exponents, and two variables; for example,

$$f(x) = 5x^3 + 6x^2 - 3x + 7$$

which can also be written as

$$f(x) = 5(x)(x)(x) + 6(x)(x) + (-3)x + 7$$

portfolio: One or more investments held by an individual investor or by a financial organization.

present value: The amount that must be invested now to result in a specific future value in a certain time at a given interest rate.

principal: The original amount of money invested or loaned.

Principle of Inclusion and Exclusion: The number of elements in the union of two sets is equal to the sum of the number of elements in each set, less the number of elements in both sets; using set notation, this is written as

$$n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

R

radian: The measure of the central angle of a circle subtended by an arc that is the same length as the radius of the circle.

rate of return: The ratio of money earned (or lost) on an investment relative to the amount of money invested, usually expressed as a decimal or a percent.

regression function: A line or curve of best fit, developed through a statistical analysis of data.

Rule of 72: A simple formula for estimating the doubling time of an investment; 72 is divided by the annual interest rate as a percent to estimate the doubling time of an investment in years. The Rule of 72 is most accurate when the interest is compounded annually.

S

scatter plot: A set of points on a grid, used to visualize a relationship or possible trend in the data.

set: A collection of distinguishable objects; for example, the set of whole numbers is

$$W = \{0, 1, 2, 3, \ldots\}.$$

simple interest: The amount of interest earned on an investment or paid on a loan based on the original amount (the principal) and the simple interest rate.

sinusoidal function: Any periodic function whose graph has the same shape as that of

$$y = \sin x$$

standard form: The standard form for a linear function is

$$f(x) = ax + b$$

where $a \neq 0$.

The standard form for a quadratic function is

$$f(x) = ax^2 + bx + c$$

where $a \neq 0$.

The standard form for a cubic function is

$$f(x) = ax^3 + bx^2 + cx + d$$

where $a \neq 0$.

subset: A set whose elements all belong to another set; for example, the set of odd digits,

$$O = \{1, 3, 5, 7, 9\},$$

is a subset of D, the set of digits.

In set notation, this relationship is written as: $O \subset D$

T

term: The contracted duration of an investment or loan.

turning point: Any point where the graph of a function changes from increasing to decreasing or from decreasing to increasing. For example, this curve has two turning points, since the y-values change from decreasing to increasing to decreasing:
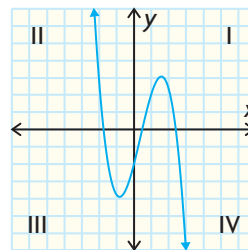
This curve does not have any turning points since the y-values are always decreasing:
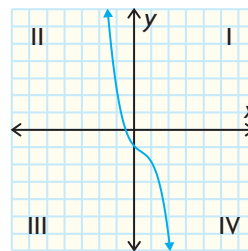
U

union: The set of all the elements in two or more sets; in set notation, $A \cup B$ denotes the union of sets A and B; for example, if $A = \{1, 2, 3\}$ and $B = \{3, 4, 5\}$, then $A \cup B = \{1, 2, 3, 4, 5\}$.

universal set: A set of all the elements under consideration for a particular context (also called the sample space); for example, the universal set of digits is

$$D = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}.$$