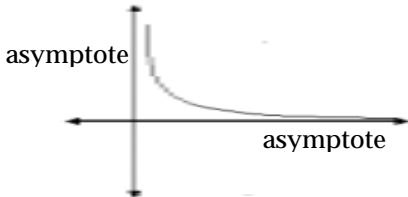


Glossary of Terms

absolute error	The <i>absolute value</i> of the difference between the measured value of a quantity and its true value.
absolute value	Distance from zero on a numberline.
acute	An angle whose measure is greater than 0° and less than 90° . An acute triangle has three acute angles.
algorithm	A procedure or series of steps used to solve a problem.
analyze	To separate into parts so as to determine the nature of the whole; to validate reasoning.
associative property	The result of an operation on real numbers will be unchanged due to grouping; e.g., for addition, $(a + b) + c = a + (b + c)$ or for multiplication, $a(bc) = (ab)c$.
asymptote	A straight line that a curve approaches but never touches. For example, 
biased sampling	A <i>sample</i> that over-represents or under-represents part of the population.

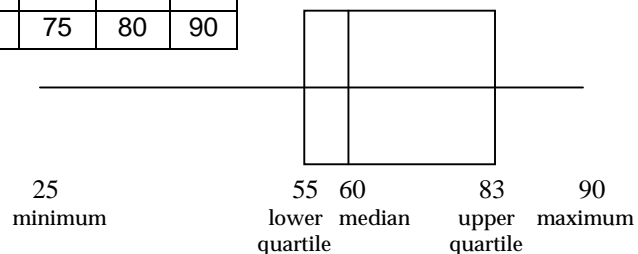
bivariate data Data or events described using two *variables*.

box-and-whisker plot A diagram that shows pictorially the *median* and *measures of spread* (upper and lower *interquartile ranges* and the *range*) for one set of data. For example,

Box-and-whisker plot data: The number of days students in Mr. Jones' homeroom spent studying for the ACT exam.

35	25	90	60	45
40	58	90	90	55
60	55	80	90	60
55	60	85	75	60
56	55	75	80	90

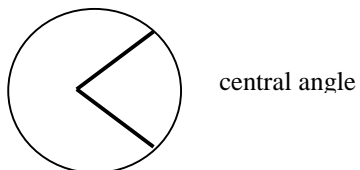
box-and-whisker plot



capacity The maximum amount that can be contained.

categorical data Data that can be classified by type; e.g., color, types of dogs. These types of data are typically represented using bar chart, pie charts or pictographs.

central angle An angle whose vertex is the center of a circle and is in the same plane.



coefficient	The numeric factor in a <i>term</i> ; e.g., the number 3 in the term $3x^2y$ is the coefficient or in the term a^3b , 1 is the coefficient.
combination	A selection of a group of items or events from a set without regard to order; e.g., the number of 3-item toppings for a burger: lettuce, tomato, pickle is the same as pickle, tomato, lettuce.
common factor	A number, <i>polynomial</i> or quantity that evenly divides into two or more mathematical expressions.
non-standard measurements	Something that is familiar that can be used to relate to another thing that is not familiar; e.g., the width of a finger is a centimeter.
commutative property	The order of the objects in an operation can be changed without affecting the results; e.g., for addition, $a + b = b + a$ or for multiplication, $ab = ba$.
compatible numbers	Numbers that go together easily, usually related by pairing in the basic facts; use of compatible numbers generally gives an estimated result; e.g., $473 \div 6 \approx 480 \div 6 = 80$.
compensatory numbers	Compensatory numbers are used to adjust numbers in a computation after use of <i>compatible numbers</i> ; e.g., $23 + 18 \approx 23 + 20 = 43$. Since two was added to increase 18 to 20 as compatible numbers, two will be subtracted from 43 to compensate for the change. Therefore, two is the compensatory number.
complementary events	Two or more <i>mutually exclusive events</i> that together cover all possible outcomes. The sum of the probabilities of complementary events is 1.

compound events	Combining two or more separate events or outcomes and considering it as one single event or outcome.
conditional probability	The probability of an event occurring given that another event has already occurred. For example, what is the probability that the total of two dice will be greater than 8 given that the first die is a 6?
congruent	Having exactly the same size and shape.
continuous data	Data that can be assigned an infinite number of values between whole numbers, the assigned values are approximated; e.g., the size of the apples on an apple tree is continuous data. See <i>discrete data</i> for a counterexample.
conventional formulas	Previously developed and established formulas.
coordinate plane/system	A plane determined by the intersection of two <i>perpendicular</i> number lines in which any point can be located.
correlation	The simultaneous change in value of two numerically valued random variables.
correlation coefficient	A measure of the <i>correlation</i> between two <i>variables</i> or sets of data. The value of the correlation coefficient, r , is always between 1 and -1 inclusive, where 1 is a perfect positive correlation, 0 is no correlation, and -1 is a perfect negative correlation.

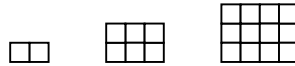
covariants	Two or more variable quantities that change in a manner that leaves the specified relationship unchanged. e.g. constant area of rectangle can be maintained if both length and width are changed.
decomposing	The process of breaking a number into smaller parts to simplify problem solving; e.g., 15 can be $10 + 5$ or 10 can be $6 + 4$.
deductive reasoning	Use logic to arrive at a conclusion from a known facts.
dependent events	Two events in which the outcome of one event <u>does</u> affect the outcome of another event.
descriptive statistics	To gather and describe data using <i>probability</i> , statistical methods and concepts like graphs and <i>measures of center</i> .
dilation	A transformation that preserves the shape of a figure, but allows the size to change.
direct variation	When the values of two <i>variables</i> maintain a constant ratio.
discrete data	Data that can be counted; e.g., the number of people in a town is discrete (there is no such thing as a fractional person). See <i>continuous data</i> for a counterexample.
disjoint events	Two events that have no outcomes in common.
dispersion	How data is spread out around some central point.
distribution	A graph or table showing how many pieces of data there are in each class, or of each type.

distributive property	The product of a number and the sum (or difference) of two numbers is equal to the sum (or difference) of the two products; e.g., $7(30 + 5) = (7 \cdot 30) + (7 \cdot 5)$ or $a(b - c) = ab - ac$.
domain	The set of values for the independent variable of a function.
equal	Having the same measure or value.
equation	A statement that shows two mathematical expressions that are equal to each other.
equiangular	In a given shape, all angles having the same measure.
equilateral	In a given shape, all sides having the same length.
equivalent	Two sets that have the same number of elements.
experimental probability	The probability based on the results of a series of trials. The experimental probability, P , can be found using the following equation: $P(\text{event}) = \frac{\text{\# of trials w/favorable outcomes}}{\text{number of trials in experiment}}$
expressions	Any combination of <i>variables</i> , numbers, and symbols (excluding the equality and inequality symbols).
extrema	A term that refers to maximum and/or minimum values.
factoring	Rewriting a mathematical expression as a product of factors.
fluency	Having efficient and accurate methods for computing.

frequency table	A table that shows how often each item, number, or range of numbers occurs in a set of data.
front-end estimation	Using the leading, or left-most, digits to make an estimate quickly and easily. After making an initial estimate using front-end digits, an adjustment can be made to refine the estimate; e.g., Using front-end estimation to estimate the sum of 594, 32, and 221, an initial estimate would be $5 + 0 + 2$ hundreds or 700. An adjustment can be made by grouping the tens and ones (about $100 + 50$ or 150 more) and adding to get a adjusted estimate of 850.
function	A mathematical relationship between two <i>variables</i> , an independent <i>variable</i> and a dependent <i>variable</i> , where every value of the independent <i>variable</i> corresponds to exactly one value of the dependent value.
Fundamental Counting Principle	The principle which states that all possible outcomes in a sample space can be found by multiplying the number of ways each event can occur.
geometric patterns	A sequence or series, where each term can be found by multiplying the previous term by a constant factor, sometimes referred to as a common ratio.
geometric probability	The probability that a random point is located in a particular part, or sub-region, of a larger region.

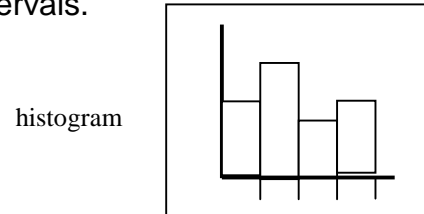
growing patterns

Patterns that involve a progression. For example,



histogram

A graph that uses bars to show the frequency of data within equal intervals.



identity property

Of addition: Adding zero to a number gives a sum identical to the given number. e.g. $4+0=4$

Of multiplication: Multiplying a number by 1 gives a product identical to the given number. e.g. $4 \times 1 = 4$

independent event

Two events in which the outcome of the first event does not affect the outcome of the second event.

inductive reasoning

Using logic to make generalizations based on observation of specific cases and consideration of patterns.

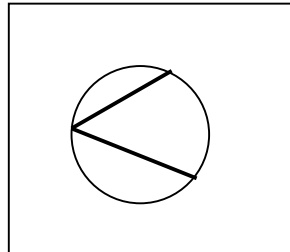
inequality

A mathematical sentence that includes one of the inequality symbols, $<$, $>$, \leq , \geq , or \neq to compare unequal expressions.

inscribed angle

An angle whose vertex is on a circle and whose sides contain chords of the circle.

inscribed
angle

**intercepts**

The value of y on the *coordinate plane* where $x = 0$, called the y -intercept. The value of x on the *coordinate plane* where $y = 0$, called the x -intercept.

intersecting lines

Two lines that cross at exactly one point.

interquartile range

The difference between the upper quartile and the lower quartile.

inverse operations

An operation that will undo another operation; e.g., addition and subtraction.

inverse variation

When the product of two variables is constant.

irrational numbers

Numbers that cannot be written as a ratio of two integers. The decimal extension of the number never terminates and never repeats.

isosceles triangle

A triangle with at least two congruent sides.

line of best fit

A line drawn in the midst of the points on a scatter plot in an attempt to estimate the mathematical relationship between the variables used to generate the plot.

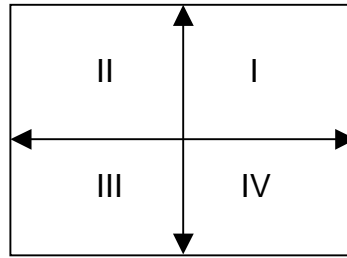
linear equation	An equation whose graph on a coordinate grid is a straight line.
major arc	An arc that is more than a semicircle or more than 180° .
manipulative	“hands-on” activities to represent and allow exploration of mathematical concepts.
mathematical expression	See <i>expression</i>
matrix	A rectangular arrangement of numbers.
mean	The sum of a set of numbers divided by the number of elements in the set (e.g. average).
measures of center	Numbers that provide information about cluster and average of a collection of data. (e.g. mean, median, mode)
measures of spread	A term used to refer to the range and quartiles for a set of data.
median	The middle number or item in a set of numbers of objects arranged from least to greatest, or the mean of the two middle numbers when the set has two middle numbers.
minor arc	An arc that is less than a semicircle or less than 180° .
mode	The number or object that appears most frequently in a set of numbers of objects.

model	A preliminary drawing or construction that serves as plan from which a mathematical concept is demonstrated & explored.
monomials	An algebraic expression which is a product of constants and <i>variables</i> .
multiplicative reasoning value	Number patterns with relationships between consecutive numbers involving multiplication.
mutually exclusive events	Two events that cannot occur at the same time.
noncontinuous	Something that is interrupted or goes on with breaks.
nonlinear progressions	A sequence of values that increase in a manner other than linear.
obtuse	An angle measure greater than 90° and less than 180° . An obtuse triangle has one obtuse angle.
odds of an event	The ratio of favorable outcomes to unfavorable outcomes.
ordered pairs	A pair of numbers that gives the location of a point on a coordinate plan in this order (horizontal coordinate, vertical coordinate).
ordinal number	To identify the position of an object in a sequence; e.g., first, second, third.
outlier	A point in a sample widely separated from the main cluster of points in the sample.

parallel lines	Lines in a plane that do not cross.
permutations	Possible orders or arrangements of a set of events or items. e.g. The number of ways to arrange toppings for a burger: lettuce, tomato, pickle is different from pickle, tomato, lettuce.
perpendicular lines	Lines that intersect at one point forming 90° angles.
polygon	A closed figure formed from line segments that meet only at their endpoints.
polynomials	The sum of monomials; e.g., $2a^2 + 4a - 5$.
precision	The exactness with which a number is specified.
prime factorization	The expression of a number as the product of prime factors; e.g., the prime factorization of 18 is $2 \cdot 3 \cdot 3$.
probability	The chance of an event occurring. The probability of an event is equal to the number of favorable outcomes divided by the number of possible outcomes.
probability distribution	The set of random data and the probabilities associated with that data.
proportion	An equation showing that two ratios are equal.

quadrants

The two axes of a coordinate system divide the plane into four separate sections known as quadrants. These are identified as the first, second, third, and fourth quadrants.



qualitative data

Data that can be assigned qualities or categories. They are non-numerical data.

quantitative data

Data that are numerical. The data can be *discrete* or *continuous*.

quartile

In conjunction with the *median*, the quartiles divide the set of data into four groups of equal size.

random sample

A *sample* in which every event has an equal chance of selection and each event is chosen by a random process.

random variable

A *variable* that takes any of a range of values that cannot be predicted with certainty.

range

- 1.The difference between the greatest and the least numbers in a set of data.
- 2.The set of values for dependent variable of a function.

rate of change

A ratio of differences between two variables (e.g. distance/time, and slope).

rational expressions	Fractions whose numerators and denominators are polynomials; e.g., $\frac{n^2 - 3n}{2}$.
rational numbers	Any number that can be written in the form $\frac{a}{b}$, where a and b are integers and $b \neq 0$.
rectangular arrays	An arrangement of things in rows and columns.
recursive function	A <i>function</i> defined in terms of the repeated application of its own values.
reflection	A transformation that results in a mirror image of the original shape.
relative error	The error or uncertainty in a measurement expressed as a fraction of the true value.
right	Relating to 90° ; e.g., a right angle measures 90° , a right triangle has only one right angle.
roots of equations	A value that will satisfy the equation which has been formed by putting an expression, containing one variable, equal to zero.
rotation	A rotation is a <i>transformation</i> about a fixed point such that every point in the object turns through the same angle relative to that fixed point.
sample	A small set of data taken from a larger set used to create or test theories about the data as a whole.

sample space	A list of all possible outcomes of an activity.
scalene triangle	A triangle that has no congruent sides.
scatterplot	A graph with one point for each item being measured. The coordinates of a point represent the measures of two attributes of each item.
scientific notation	A form of writing numbers as the product of a power of 10 and a decimal number greater than or equal to 1 and less than 10; e.g., 8,924,000 is written as 8.924×10^6 .
sequence	A set of objects or numbers that follow a pattern.
series	Sum of a finite or infinite sequence of numbers.
similar	Objects that are the same shape but different size.
simple event	A subset of the <i>sample space</i> that contains only one outcome that cannot be broken down into a simpler, more basic outcome.
skew lines	Lines on different planes that are neither parallel nor intersecting.
standard deviation	The measure of the <i>dispersion</i> of a distribution. It is the square root of variance.

stem-and-leaf plot

A frequency diagram which displays the actual data together with its frequency, by using a part of the value of each piece of data to fix the class or group (the stem), while the remainder of the value is actually listed (the leaves). For example,

Stem-and-leaf plot data: Coach Smith's last 30 basketball game scores for the 7th grade Wildcats.

50	65	70	35	40	57	66	65	70	35
29	33	44	56	66	60	44	50	58	46
67	78	79	47	35	35	44	57	60	57

stem-and-leaf plot

Stem	Leaves
2	9
3	3 5 5 5 6
4	0 4 4 4 6 7
5	0 0 6 7 7 7 8
6	0 0 5 5 6 6 7
7	0 0 8 9

Key: 4|6 represents a score of 46.

successive approximation

To find the approximate value of a quantity by starting from a first estimate and then deriving from each approximation another that is more accurate.

symbol

A printed or written sign used to represent an operation or a quantity.

symbolic form/algebra To represent something using numbers and symbols.

tabular

Organized as a table or list.

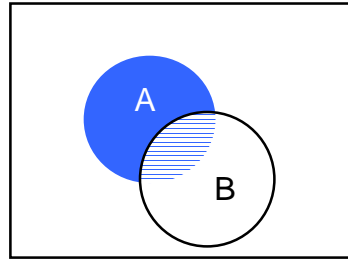
target population

The set from which a sample will be selected.

terms	The quantities in an algebraic equation that are linked to each other by means of + or - signs.
theoretical probability	Identifying, using mathematical expectations, the number of ways an event should happen. (e.g. 10 coin tosses results in 5 heads and 5 tails)
transcendental function	<i>Functions</i> that are not algebraic; e.g., trigonometric functions.
transformation	An operation that creates an image from an original figure.
translation	A <i>transformation</i> in which an image is formed by moving every point on a figure the same distance in the same direction.
two-dimensional figures	A shape that has two dimensions, usually described in terms of length and width.
univariate data	Data or events described using only one variable.
variable	A changing quantity, usually a letter in an algebraic expression or equation.
variance	How far away data is from the mean. It is the square of standard deviation.

Venn Diagram

A diagram that is used to show relationships between sets.



volume

The amount of space occupied by a three-dimensional object.

zeros of a function

The roots of a *function* or the *x*-intercepts.