Definitions

Chapter 1

Acute angle	An angle measuring between 0° and 90° degrees.
Adjacent angles	Two angles in a plane that have a common vertex and a common side but no common interior points.
Angle	A figure formed by two rays having a common endpoint.
Bisector of an angle	The ray that divides the angle into two congruent adjacent angles.
Bisector of a segment	A line, segment, ray or plane that intersects a segment at its midpoint.
Circle	The set of all points in a plane that are a given distance from a single fixed point.
Collinear points	Points all on one line.
Congruent	Figures that have the same size and shape.
Congruent angles	Angles that have equal measures.
Congruent segments	Segments that have equal lengths.
Coordinate	The number associated with a point.
Coplanar points	Points all on one plane.
Distance of a line segment	The absolute value of the difference of the coordinates of the endpoints.
Endpoint	The terminus of a segment or ray.
Equidistant	The same distance away.
“Exactly one”	Means one and only one.
“Exists”	Means at least one.
Intersection	The set of points common to two or more figures.
Length	The distance between the endpoints of a segment.

Definitions

Line	A set of points, extending infinitely in two directions, having one dimension, length.
Measure of an angle	The number of degrees between the sides as determined by postulate 3.
Midpoint of a segment	The point dividing a segment into two congruent segments.
Number line	Has each point paired with a real number.
Obtuse angle	An angle measuring between 90° and 180°.
Opposite rays	Two coplanar rays with the same endpoint traveling in opposite directions.
Plane	A set of points creating any flat surface that extends infinitely in the dimensions of length and width.
Point	Any location having no dimension.
Postulate or axiom	A statement accepted without proof.
Ray	A set of points beginning with an endpoint and traveling infinitely in one direction.
Right angle	An angle measuring exactly 90°.
Segment	A set of points consisting of two points on a line and all the points in between.
Side of an angle	Is a ray.
Space	The set of all points.
Straight angle	An angle measuring exactly 180°.
Undefined terms	The intuitive ideas of point, line and plane
“Unique”	Means no more than one.
Vertex of an angle	The endpoint shared by the two rays which form the angle.

Definitions

Chapter 2

4 basic patterns for a conditional are	if hypothesis, then conclusion hypothesis implies conclusion hypothesis only if conclusion conclusion if hypothesis
Biconditional	A conditional such that both the conditional and its converse are true.
Complementary angles	A pair of coplanar angles whose measurements add up to be 90 degrees.
Conclusion	Information that can be added to a problem when the criteria of the hypothesis have been met.
Conditional	A logical "recipe" which has two main parts: the hypothesis and the conclusion
Converse	Another conditional statement formed by interchanging the hypothesis and the conclusion of a given statement.
Counterexample	Used to prove a conditional false
Deductive reasoning	A logical process by which conditionals are proven true by building an argument based upon accepted postulates, definitions, theorems and their corollaries, and properties.
Hypothesis	Information that must be known in order to apply the conclusion to the problem.
Perpendicular lines	Two lines that intersect to form right angles.
Reasons used in a proof	given information postulates definitions theorems and their corollaries properties
Supplementary angles	A pair of coplanar angles whose measurements add up to be 180 degrees.
Vertical angles	A pair of coplanar angles such that the sides of one angle are opposite rays to the sides of the other angle.

Definitions

Chapter 3

Acute triangle	A triangle in which all angles are acute.
Auxiliary line	A line or part of a line added to a picture in order to help with the solution.
Concave polygon	A dented polygon.
Convex polygon	A polygon such that no line containing a side of the polygon contains a point on the interior of the polygon.
Corollary	A statement easily proven by applying a theorem.
Decagon	A 10-sided polygon.
Diagonal	A segment connecting two nonconsecutive vertices of a polygon.
Equiangular polygon	A polygon in which all angles are congruent
Equilateral triangle	A triangle in which all sides are congruent.
Exterior angle	An angle formed by extending one side of a polygon.
Hexagon	A 6-sided polygon.
Inductive reasoning	A method of logical argument where universal rules are created by finding patterns among several specific examples.
Isosceles triangle	A triangle in which at least two sides are congruent.
Line parallel to a plane	A line that does not intersect the plane.
n-gon	n-sided polygon.
Obtuse triangle	A triangle in which one angle is obtuse.
Octagon	An 8-sided polygon.
Parallel lines	Coplanar lines that do not intersect.
Parallel planes	Two or more planes that do not intersect.
Pentagon	A 5-sided polygon.
Polygon	A figure formed by coplanar segments such that each segment intersects exactly two other segments, one at each endpoint; and no two segments with a common endpoint are collinear.
Quadrilateral	A 4-sided polygon.
Regular polygon	A polygon that is both equilateral and equiangular.
Remote interior angles	The pair of angles inside of a triangle that is not adjacent to a given exterior angle.
Right triangle	A triangle in which one angle is 90°.
Scalene triangle	A triangle in which no sides are congruent.
Side	A segment forming a figure.
Skew lines	Non-coplanar lines that do not intersect.

Definitions

Transversal	A line that intersects two or more coplanar lines at different points.
Triangle	A figure formed by three segments joining three non-collinear points.
Vertex	A ‘corner’ of a polygon.

Definitions

Chapter 4

Altitude	A line segment from a vertex perpendicular to the opposite side of a triangle.
Base	A side opposite the vertex of an isosceles triangle.
Base angles	Angles formed by a leg and the base of an isosceles triangle.
Congruent triangles	Two triangles such that the vertices can be matched up so that corresponding parts are congruent.
Distance from a point to a line	The length of the segment from the point perpendicular to the line.
Legs	Congruent sides of an isosceles triangle.
Line perpendicular to a plane	They intersect and the line is perpendicular to all lines in the plane passing through the point of intersection.
Median	A line segment that forms a vertex to the midpoint of the opposite side of a triangle.
Perpendicular bisector	A line, segment, or ray that is perpendicular to a segment at its midpoint.
Vertex angle	An angle formed by the legs of an isosceles triangle.

Definitions

Chapter 5

bases of a trapezoid	parallel sides
isosceles trapezoid	quadrilateral with congruent legs
legs of a trapezoid	non-parallel sides
median of trapezoid	segment joining the midpoints of the legs
parallelogram	quadrilateral with both pairs of opposite sides being parallel
rectangle	quadrilateral with four right angles
rhombus	quadrilateral with four congruent sides
square	quadrilateral with four congruent sides and four right angles
trapezoid	quadrilateral with exactly one pair of parallel sides

Chapter 6

conclusion	represented in a Venn diagram by the larger outer circle
conditional	logical equivalent of the contrapositive
contrapositive	is created form a given conditional statement by both negating and switching the position of the conditional's hypothesis and conclusion
converse	logical equivalent of the inverse
hypothesis	represented in a Venn diagram by the smaller inner circle
inverse	is created from a given conditional statement by negating the conditional's hypothesis and conclusion
logical equivalent	two statement with the same meaning that are worded differently
Venn diagram	picture which illustrates the relationship between the hypothesis and the conclusion of a conditional with two circles, one inside the other

Definitions

Chapter 7

divided proportionally	points L and M lies on segments AB & CD respectively and (AL)(MD) = (LB)(CM)
extended proportion	three or more ratios set equal to one another
proportion	two ratios set equal to one another
ratio	a quotient expressed in simplest form
scale factor	the ratio of corresponding sides for similar polygons
similar polygons	polygons whose vertices can be paired such that corresponding angles are congruent and corresponding sides are in proportion

Chapter 8

angle of depression	the line of sight angle measured down from a horizontal line
angle of elevation	the line of sight angle measured up from a horizontal line
cosine of an angle	the ratio of the adjacent leg to the hypotenuse of a right triangle
geometric mean	the number x between two numbers a and b that satisfies the proportion a:x = x:b
grade	the slope of a surface or the tangent of the angle of elevation which is expressed as a percentage
sine of an angle	the ratio of the opposite leg to the hypotenuse of a right triangle
SOHCAHTOA	a mnemonic used to remember the trigonometric ratios
tangent of an angle	the ratio of the opposite leg to the adjacent leg of a right triangle

Definitions

Chapter 9

adjacent arc	arcs of the circle that have exactly one point in common
central angle	angle whose vertex lies on the center of a circle
chord	a segment whose endpoints lie on a circle
circle	set of all coplanar points a given distance (radius) from a given point (center)
circumscribed polygon	all sides are tangents of the circle
concentric circles	coplanar circles with the same center
concentric spheres	spheres with the same center
congruent arc	arcs on the same circle or congruent circles that have equal measurements
congruent circles (spheres)	circles (spheres) with congruent radii
diameter	chord that passes through the center
external common tangent	a line tangent to two coplanar circles and doesn't intersect the segment joining the centers of the circles
externally tangent circles	coplanar circles that are tangent to the same line at the same point and their centers are on opposite sides of the line
inscribed angle	angle whose vertex lies on a circle and whose sides contain chords of the circle
inscribed polygon	all vertices lie on the circle
intercepted arc	the arc between the sides of an inscribed angle
internal common tangent	a line tangent to two coplanar circles and intersects the segment joining the centers of the circles
internally tangent circles	coplanar circles that are tangent to the same line at the same point and their centers are on the same side of the line
major arc	an unbroken part of a circle that measures more than 180°
measure of major arc	360° - measure of its minor arc
measure of minor arc	measure of its central angle
minor arc	an unbroken part of a circle that measures less than 180°
secant	line that contains a chord
semicircle	an unbroken part of a circle that measures exactly 180°
sphere	set of all points in space a given distance (radius) from a given point (center)
tangent	line in the plane of a circle that intersects the circle at exactly one point (point of

Definitions

tangency)

Definitions

Chapter 10

centroid	intersection of the medians of a triangle
circumcenter	intersection of the perpendicular bisectors of the sides of the triangles
concurrent lines	two or more coplanar lines that intersect at the same point
description of locus	precise explanation of the set of points meeting the criteria of a problem
incenter	intersection of the bisectors of the angles of a triangle
locus	the set of all points and only those points which satisfy one or more conditions
locus with multiple conditions	described as the intersection of sets of points
orthocenter	intersection of the altitudes of a triangle

Definitions

Chapter 11

base	any side of a rectangle or parallelogram
altitude of rectangle	any segment perpendicular to a line containing a base from a point on the opposite side
height	length of the altitude
altitude of trapezoid	any segment perpendicular to a line containing a base from a point on the opposite base
center of a regular polygon	center of the circumscribed circle
radius of a regular polygon	distance from the center to a vertex
central angle of a regular polygon	angle formed by two radii drawn to consecutive vertices
apothem of a regular polygon	distance from the center to a side
circumference	the limit of the sequence of numbers representing the perimeters of the inscribed regular polygons as the number of sides goes to infinity
area of a circle	the limit of the sequence of numbers representing the areas of the inscribed regular polygons as the number of sides goes to infinity
sector of a circle	region of a circle defined by two radii and the arc connecting the outer endpoints
arc length	the product of the circumference and the measurement of the arc divided by 360
sector area	the product of the area and the measurement of the arc divided by 360
linear geometric probability	the chances of a randomly chosen point being on a given segment
regional geometric probability	the chances of a randomly chosen point being within the boundaries of a given region

Definitions

Chapter 12

altitude of prism	a segment joining and perpendicular to the base planes
altitude of pyramid	segment from the vertex perpendicular to the base
base of prism	congruent polygons lying in parallel planes
base of pyramid	polygon opposite the vertex
cone	a pyramid with a circular base
cube	a rectangular solid with square faces
cylinder	a prism with circular bases
lateral area	the sum of the areas of the lateral faces
lateral edge	intersection of adjacent lateral faces
lateral face of prism	the parallelograms making up the sides of the prism. They do not have to be parallel or congruent.
lateral face of pyramid	triangles making up the sides of the pyramid intersecting at the vertex
oblique prism	lateral faces are simply parallelograms & lateral edge is not altitude
prism	a geometric solid having two polygon bases and having parallelograms for its lateral faces
pyramid	a geometric solid having one polygon base and triangular lateral faces
regular prism	bases are regular polygons and lateral edges are congruent; therefore, the lateral faces are congruent parallelograms
regular pyramid	base is a regular polygon and lateral edges are congruent; therefore, lateral faces are congruent isosceles triangles altitude intersects the center of the base
right cylinder	the segment joining the centers of the bases is an altitude
right prism	lateral faces are rectangles & lateral edge is altitude
similar solids	solids that have the same shape but not necessarily the same size. They must have the same shape as their base and the corresponding lengths must be proportional
slant height	the height of the lateral face of a regular pyramid
total area of prism	the sum of the lateral area and the areas of the bases. For a prism or cylinder $TA = LA + 2B$, for a pyramid or cone $TA = LA + B$ where LA is the lateral area and B is the area of a

Definitions

	base .
vertex	the intersection of all lateral faces

Definitions

Chapter 13

	$\sqrt{H^2 + V^2}$
	$H_1H_2 + V_1V_2$
	$(H_1 + H_2, V_1 + V_2)$
	$(H_1 - H_2, V_1 - V_2)$
addition	method for solving systems of linear equations by eliminating the variable with opposite coefficients
coordinate plane	plane formed by the intersection of the coordinate axes
dot product	$(H_1, V_1) \bullet (H_2, V_2)$
equal vectors	same magnitude and direction
graphing	method of solving systems of linear equations that can be used on any system, but can lead to incorrect answers
horizontal component	$x_2 - x_1$
line with negative slope	rise to the left
line with positive slope	rise to the right
magnitude of vector	length of vector
multiplication	method for solving systems of linear equations by creating either the same or opposite coefficients
origin	intersection of the axes
quadrant I	x-coordinate positive, y-coordinate positive
quadrant II	x-coordinate negative, y-coordinate positive
quadrant III	x-coordinate negative, y-coordinate negative
quadrant IV	x-coordinate positive, y-coordinate negative
scalar multiplication	$k (H, V) = (kH, kV)$
slope	$m, \frac{y_2 - y_1}{x_2 - x_1}, \frac{\Delta y}{\Delta x}, \frac{\text{rise}}{\text{run}}$, and $-\frac{A}{B}$
slope of a vector	$\frac{V}{H}$
slope of horizontal line	zero
slope of vertical line	not defined
steeper line	slope has greater absolute value
substitution	method for solving systems of linear equations by replacing a variable with an equivalent expression which is best used when there is a coefficient of 1 or - 1
subtraction	method for solving systems of linear equations by eliminating the variable with the same coefficient

Definitions

vector	segment with both magnitude and direction
vector addition	$(H_1, V_1) + (H_2, V_2)$
vector subtraction	$(H_1, V_1) - (H_2, V_2)$
vertical component	$y_2 - y_1$
x-axis	horizontal line of reference
x-intercept	$\left(\frac{C}{A},0\right)$
y-axis	vertical line of reference
y-intercept	$\left(0,\frac{C}{B}\right)$

Definitions

Chapter 14

bilateral symmetry	a figure with a single plane of symmetry
composite	a new mapping formed by combining two or more mappings.
congruence mapping	a transformation that preserves distance
contraction	a dilation with $\lvert k \rvert < 1$
dilation	a similarity transformation
dilation where P' lies on ray OP & OP' = kOP	a dilation with $k > 0$
dilation where P' lies on ray opposite to OP & OP' = $\lvert k \rvert$OP	a dilation with $k < 0$
expansion	a dilation with $\lvert k \rvert > 1$
function	correspondence between sets of numbers such that for every value of the preimage there is only one value in the image
glide reflection	a two step mapping which first slides all points along a vector parallel to the mirror and then reflects those image points into the mirror.
glide reflection symmetry	the isometry that maps the figure onto itself is a glide reflection. The vector and the mirror of the glide reflection are your vector and your line of symmetry. There can be more than one pair of vector and line of symmetry.
half turn	a rotation of 180°
identity mapping	the mapping that maps every point to itself, called the I mapping
image	the copy
inverse mapping	the inverse of a mapping S is the mapping which moves the images of S back to the preimages of S, called S^{-1}.
isometry	a transformation that preserves distance
line symmetry	the isometry which maps the figure onto itself is a reflection. The mirror of the reflection is your line of symmetry.
mapping	correspondence between sets of points
one-to-one mapping	a type of mapping in which every image has exactly one preimage
point symmetry	the isometry which maps the figure onto itself is a half-turn. The center of the half-turn is the point of symmetry

Definitions

plane symmetry	the isometry which maps the figure onto itself is a reflection into a plane.
preimage	the original
reflection	a mapping into a line m that moves every point P to a point P' such that: 1. If P is not on m, then m is the $\perp$ bisector of the segment joining P to P'. 2. If P is on m, then P = P'.
relation	correspondence between sets of numbers
rotation	a mapping which moves all points around a stationary point O, x degrees such that: 1. If P is not O, then PO = P'O and m $\angle$ POP' = x. 2. If P = O, then P = P'
rotational symmetry	the isometry which maps the figure onto itself is a rotation. The angle of rotation is the symmetry angle. Rotational symmetries can have more than one symmetry angle.
similarity mapping	a mapping where the preimage and image are similar.
symmetry	a figure in a plane has symmetry if there is an isometry, other than the identity, that maps the figure onto itself.
tessellation	a pattern where congruent copies of a figure fill the plane.
transformation	a one-to-one mapping of the whole plane onto the whole plane
translation	a transformation in which all points are moved along the same vector
translational symmetry	the isometry that maps the figure onto itself is a translation. The vector for the translation is the vector of symmetry. There can be more than one vector of symmetry.