Greek 40 Word Lookup

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Sources:
Greek Lookup:

1. Bill Mounce
2. Liddell, Scott, Jones Ancient Greek Lexicon
3. Euclid's Elements of Geometry (Greek Text)

Math Definition Lookup:

1. Introduction To Topology by James R. Munkres

Term	Definition	Greek	Literal Translation
Point	A point is that which has no part.	*σημειον*	Mark, dot
Line	A line is breadthless length.	*γραμμη*	Letter, That which is drawn
Straight Line	A straight line is one which lies evenly with the points on itself.	*ευθεια γραμμη*	That which is drawn at once
Surface	A surface is that which has length and breadth only.	*επιφανεια*	Appearing at once
Plane Surface	A plane surface is one which lies evenly with the straight lines on itself.	*επιπεδος επιφανεια*	Appearing at once and level-like
Plane Angle	An angle is the inclination of two lines to one another in a plane, which meet but do not lie in a straight line.	*επιφανεια γωνια*	level corner (angle)
Circle	A circle is a plane figure contained by one line, such that all straight lines radiating towards [the circumference] from one point amongst those lying inside the figure are equal to one another.	*κυκλος*	Circle, Ring
Center of a Circle	The center of a circle is the point equidistant from all points on the circle.	*κεντρον δε του κυκλου το σημειον καλειται*	The Sharp point (*κεντρον*) is called the center of the circle
Radius	A radius is any straight line drawn from the center to the circumference of a circle.	*περιβαλλω*	Encompassing Encircling
Diameter	A diameter is any straight line drawn through the center and terminated at both ends by the circumference.	*διαμετρος*	Diameter
Semicircle	A semicircle is the figure contained by the diameter and the part of the circumference cut off by it.	*Σχηματα ευθυγραμμα*	Form of that which is drawn straight
Parallel Lines	Parallel lines are lines which, being in the same plane, do not meet however far produced in either direction.	*παραλληλοι*	Beside one another
Triangle	A triangle is a plane figure contained by three straight lines.	*τριπλευρα*	Three Sides
Quadrilateral	A quadrilateral is a plane figure contained by four straight lines.	*τετραπλευρα*	Four-sided
Postulate	A claim that is asserted as true.	*ομολογημα*	That which is agreed upon

Table 1: Euclidean Geometry Definitions

Term	Definition	Greek/Latin	Literal
Relation	A relation R between two sets X and Y is a subset of the Cartesian product $X \times Y$. For example, $R = \{(x, y) \mid x \text{ is related to } y\}$.	*relatio*	Connection
Function	A function $f : X \to Y$ is a special type of relation where each $x \in X$ is associated with exactly one $y \in Y$. Functions can be characterized by their injectivity and surjectivity.	*functio*	A performance
Injective (One-to-One)	A function $f : X \to Y$ is injective if distinct elements in X map to distinct elements in Y. Formally, $f(x_1) = f(x_2) \implies x_1 = x_2$.	*in* + *jacere*	To throw into
Surjective (Onto)	A function $f : X \to Y$ is surjective if every element in Y is the image of some element in X. Formally, $\forall y \in Y, \exists x \in X$ such that $f(x) = y$.	*sur* + *jacere*	To throw over
Inverse	For a bijective function $f : X \to Y$, an inverse function $f^{-1} : Y \to X$ satisfies $f(f^{-1}(y)) = y$ and $f^{-1}(f(x)) = x$.	*invertere*	To turn upside down
Image	For a function $f : X \to Y$, the image is the subset of Y consisting of all outputs of f. Formally, $\text{Im}(f) = \{f(x) \mid x \in X\}$.	imago	Copy
Domain	The domain of a function $f : X \to Y$ is the set of all possible inputs X. Formally, $\text{Dom}(f) = \{x \mid f(x) \text{ is defined}\}$.	*domus*	House
Codomain	The codomain of a function $f : X \to Y$ is the set Y, which contains all possible outputs of f. Note, not all elements in the codomain need to be in the image.	*com* + *domus*	Together + House

Table 2: Pre-Topology

Term	Definition	Greek/Latin	Literal
Topology	A collection T of subsets of X having the following properties: 1. $\emptyset$ and X are in T 2. The union of any subcollection of T is in T 3. The intersection of any finite subcollection of T is in T	$\tau o \pi o \varsigma$ + $\lambda o \gamma \iota \alpha$	Study of places
Open Set	A set $U \subseteq X$ is called open if for every point $x \in U$, there exists an open neighborhood of x entirely contained in U.	Latin & Greek non. Close to *hiatus* + *secta*	Opening + A following
Base / Basis	A basis is a collection of open sets such that every open set can be expressed as a union of these basis elements. 1. A subset $B \subseteq T$ is a basis if for every open set U in T, there exists a subset of B whose union is U. 2. Basis elements must satisfy the following: If $B_1, B_2 \in B$, and $x \in B_1 \cap B_2$, then there exists $B_3 \in B$ such that $x \in B_3 \subseteq B_1 \cap B_2$.	*basis* or $\beta \alpha \sigma \iota \varsigma$	Foundation or A step that on which one steps, or stands
Continuous	A function $f : X \to Y$ is continuous if the preimage of every open set in Y is an open set in X.	*continere*	To be uninterrupted
Homeomorphism	A continuous function $f : X \to Y$ with a continuous inverse $f^{-1} : Y \to X$. Homeomorphisms preserve topological properties such as connectedness and compactness. 1. f is a bijection. 2. f is continuous. 3. f^{-1} is continuous.	$o \mu o \iota o \varsigma$ + $\mu o \rho \phi \eta$	Same form
Closed Set	A set $C \subseteq X$ is called closed if its complement, $X \setminus C$, is an open set.	*claudere* + *secta*	To close + A following
Compact	A space X is compact if every open cover of X has a finite subcover.	*compingere*	To fasten together
Connected	A space X is connected if it cannot be divided into two disjoint non-empty open sets.	*con* + *nectere*	To bind together
Subspace	A subspace is a subset Y of X equipped with the subspace topology, where the open sets in Y are intersections of open sets in X with Y.	*sub* + *spatium*	Under + Room
Limit Point	A point x is a limit point of a set $S \subseteq X$ if every neighborhood of x contains at least one point of S different from x.	*limen* + *pungere*	Threshold + To peirce
Closure	The closure of a set S is the smallest closed set containing S, which is the union of S and its limit points.	*claudere*	To close
Interior	The interior of a set S is the largest open set contained in S.	*intra*	Within
Boundary	The boundary of a set S is the set of points where every neighborhood intersects both S and its complement.	*bodina* + *ary*	Having the characteristic of limits (medieval latin c. 1300.)
Product Topology	The topology on the Cartesian product of two spaces X and Y, where open sets are unions of products of open sets from X and Y.	*productum* + $\tau o \pi o \varsigma$	Something produced + Place
Quotient Topology	The topology on a set of equivalence classes, induced by a surjective map $f : X \to Y$. A subset $U \subseteq Y$ is open if $f^{-1}(U)$ is open in X.	*quot* + $\tau o \pi o \varsigma$	Reduction + Place
Metric Space	A set X with a metric $d : X \times X \to \mathbb{R}$ that defines a distance between points. Open balls form a basis for the topology.	$\mu \varepsilon \tau \rho o \nu$ + *spatium*	Measure + Room
Discrete Topology	A topology where every subset is open. It is the finest topology on a set.	*discretus* + $\tau o \pi o \varsigma$	Separate + Place

Table 3: Topology Terms