Aleph

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Aleph (or alef or alif, transliterated ?) is the first letter of the Semitic abjads, including Phoenician ??lep ?, Hebrew ??lef ??, Aramaic ??lap ?, Syriac ??lap? ?, Arabic ?alif ??, and North Arabian ?. It also appears as South Arabian ? and Ge'ez ?älef ?.

These letters are believed to have derived from an Egyptian hieroglyph depicting an ox's head to describe the initial sound of *?alp, the West Semitic word for ox (compare Biblical Hebrew ?????? ?elef, "ox"). The Phoenician variant gave rise to the Greek alpha (?), being re-interpreted to express not the glottal consonant but the accompanying vowel, and hence the Latin A and Cyrillic ? and possibly the Armenian letter ?.

Phonetically, aleph originally represented the onset of a vowel at the glottis. In Semitic languages, this functions as a prosthetic weak consonant, allowing roots with only two true consonants to be conjugated in the manner of a standard three consonant Semitic root. In most Hebrew dialects as well as Syriac, the aleph is an absence of a true consonant, a glottal stop ([?]), the sound found in the catch in uh-oh. In Arabic, the alif represents the glottal stop pronunciation when it is the initial letter of a word. In texts with diacritical marks, the pronunciation of an aleph as a consonant is rarely indicated by a special marking, hamza in Arabic and mappiq in Tiberian Hebrew. In later Semitic languages, aleph could sometimes function as a mater lectionis indicating the presence of a vowel elsewhere (usually long). When this practice began is the subject of some controversy, though it had become well established by the late stage of Old Aramaic (ca. 200 BCE). Aleph is often transliterated as U+02BE ? MODIFIER LETTER RIGHT HALF RING, based on the Greek spiritus lenis ?; for example, in the transliteration of the letter name itself, ??leph.

Aleph (disambiguation)

Look up aleph in Wiktionary, the free dictionary. Aleph is the first letter of many Semitic abjads (alphabets). Aleph may also refer to: ALEPH experiment

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Aleph may also refer to:

Aleph number

In mathematics, particularly in set theory, the aleph numbers are a sequence of numbers used to represent the cardinality (or size) of infinite sets.

In mathematics, particularly in set theory, the aleph numbers are a sequence of numbers used to represent the cardinality (or size) of infinite sets. They were introduced by the mathematician Georg Cantor and are named after the symbol he used to denote them, the Hebrew letter aleph (?).

The smallest cardinality of an infinite set is that of the natural numbers, denoted by

?

0

{\displaystyle \aleph _{0}}

(read aleph-nought, aleph-zero, or aleph-null); the next larger cardinality of a well-ordered set is

?

1

,

{\displaystyle \aleph _{1},}

then

?

2

,

{\displaystyle \aleph _{2},}

then

?

3

,

{\displaystyle \aleph _{3},}

and so on. Continuing in this manner, it is possible to define an infinite cardinal number

?

?

{\displaystyle \aleph _{\alpha }}

for every ordinal number

?

,

{\displaystyle \alpha ,}

as described below.

The concept and notation are due to Georg Cantor,

who defined the notion of cardinality and realized that infinite sets can have different cardinalities.

The aleph numbers differ from the infinity (

?

{\displaystyle \infty }

) commonly found in algebra and calculus, in that the alephs measure the sizes of sets, while infinity is commonly defined either as an extreme limit of the real number line (applied to a function or sequence that "diverges to infinity" or "increases without bound"), or as an extreme point of the extended real number line.

Continuum hypothesis

is equivalent to the following equation in aleph numbers: 2 ? 0 = ? 1 {\displaystyle 2^{\aleph _{0}}=\aleph _{1}} , or even shorter with beth numbers:

In mathematics, specifically set theory, the continuum hypothesis (abbreviated CH) is a hypothesis about the possible sizes of infinite sets. It states:

There is no set whose cardinality is strictly between that of the integers and the real numbers.

Or equivalently:

Any subset of the real numbers is either finite, or countably infinite, or has the cardinality of the real numbers.

In Zermelo–Fraenkel set theory with the axiom of choice (ZFC), this is equivalent to the following equation in aleph numbers:

2

?

0

=

?

1

{\displaystyle 2^{\aleph _{0}}=\aleph _{1}}

, or even shorter with beth numbers:

?

1

=

?

1

{\displaystyle \beth _{1}=\aleph _{1}}

.

The continuum hypothesis was advanced by Georg Cantor in 1878, and establishing its truth or falsehood is the first of Hilbert's 23 problems presented in 1900. The answer to this problem is independent of ZFC, so

that either the continuum hypothesis or its negation can be added as an axiom to ZFC set theory, with the resulting theory being consistent if and only if ZFC is consistent. This independence was proved in 1963 by Paul Cohen, complementing earlier work by Kurt Gödel in 1940.

The name of the hypothesis comes from the term continuum for the real numbers.

Aleph Zadik Aleph

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The Grand Order of the Aleph Zadik Aleph (AZA or ???) is an international youth-led fraternal organization for Jewish teenagers. It was founded in 1924 as the male wing of BBYO Inc., an independent non-profit organization. It is for teens starting in 8th grade, through 12th grade.

Cardinal number

introduced, which are often denoted with the Hebrew letter ? {\displaystyle \aleph } (aleph) marked with subscript indicating their rank among the infinite cardinals

In mathematics, a cardinal number, or cardinal for short, is what is commonly called the number of elements of a set. In the case of a finite set, its cardinal number, or cardinality is therefore a natural number. For dealing with the case of infinite sets, the infinite cardinal numbers have been introduced, which are often denoted with the Hebrew letter

?

{\displaystyle \aleph }

(aleph) marked with subscript indicating their rank among the infinite cardinals.

Cardinality is defined in terms of bijective functions. Two sets have the same cardinality if, and only if, there is a one-to-one correspondence (bijection) between the elements of the two sets. In the case of finite sets, this agrees with the intuitive notion of number of elements. In the case of infinite sets, the behavior is more complex. A fundamental theorem due to Georg Cantor shows that it is possible for two infinite sets to have different cardinalities, and in particular the cardinality of the set of real numbers is greater than the cardinality of the set of natural numbers. It is also possible for a proper subset of an infinite set to have the same cardinality as the original set—something that cannot happen with proper subsets of finite sets.

There is a transfinite sequence of cardinal numbers:

0

,

1

,

2

,

3

,

…

,

n

,

…

;

?

0

,

?

1

,

?

2

,

…

,

?

?

,

…

.

{\displaystyle 0,1,2,3,\ldots ,n,\ldots ;\aleph _{0},\aleph _{1},\aleph _{2},\ldots ,\aleph _{\alpha },\ldots .\ }

This sequence starts with the natural numbers including zero (finite cardinals), which are followed by the aleph numbers. The aleph numbers are indexed by ordinal numbers. If the axiom of choice is true, this transfinite sequence includes every cardinal number. If the axiom of choice is not true (see Axiom of choice § Independence), there are infinite cardinals that are not aleph numbers.

Cardinality is studied for its own sake as part of set theory. It is also a tool used in branches of mathematics including model theory, combinatorics, abstract algebra and mathematical analysis. In category theory, the cardinal numbers form a skeleton of the category of sets.

Aum Shinrikyo

Aleph (Japanese: ???, Hepburn: Arefu), better known by their former name Aum Shinrikyo (??????, Oumu Shinriky?; lit. 'religion of Aum Supreme Truth')

Aleph (Japanese: ???, Hepburn: Arefu), better known by their former name Aum Shinrikyo (??????, Oumu Shinriky?; lit. 'religion of Aum Supreme Truth'), is a Japanese new religious movement and doomsday cult founded by Shoko Asahara in 1987. It carried out the deadly Tokyo subway sarin attack in 1995 and was then found to have been responsible for the Matsumoto sarin attack the previous year.

The group says that those who carried out the attacks did so secretly, without their plans being known to other executives and ordinary believers. Asahara insisted on his innocence in a radio broadcast relayed from Russia and directed toward Japan.

On 6 July 2018, after exhausting all appeals, Asahara and six followers on death row were executed as punishment for the 1995 attacks and other crimes. Six additional followers were executed on 26 July. At 12:10 AM, on New Year's Day 2019, at least nine people were injured (one seriously) when a car was deliberately driven into crowds celebrating the new year on Takeshita Street in Tokyo. Local police reported the arrest of Kazuhiro Kusakabe, the suspected driver, who allegedly admitted to intentionally ramming his vehicle into crowds to protest his opposition to the death penalty, specifically in retaliation for the execution of the aforementioned Aum cult members.

Aum Shinrikyo, which split into Aleph and Hikari no Wa in 2007, had already been formally designated a terrorist organization by several countries, including Russia, Canada, Japan, France, Kazakhstan, and the European Union. It was previously designated by the United States as a terrorist organization until 2022, when the State Department determined the group to be largely defunct.

The Public Security Intelligence Agency considered Aleph and Hikari no Wa to be branches of a "dangerous religion" and it announced in January 2015 that they would remain under surveillance for three more years. The Tokyo District Court canceled the extension to surveillance of Hikari no Wa in 2017 following legal challenges from the group, but continued to keep Aleph under watch. The government appealed the cancellation, and in February 2019, the Tokyo High Court overturned the lower court's decision, reinstating the surveillance, citing no major changes between Aum Shinrikyo and Hikari no Wa.

Aleph Alpha

Aleph Alpha GmbH is a German artificial intelligence (AI) startup company. Aleph Alpha attempts to achieve independence from US companies and comply with

Aleph Alpha GmbH is a German artificial intelligence (AI) startup company.

Aleph Alpha attempts to achieve independence from US companies and comply with European data protection regulations. It develops large language models (LLM), which try to provide transparency of its sources used for the results generated and are intended for enterprises and governmental agencies only. Training of its chatbot has been done in five European languages.

The Aleph (short story)

"The Aleph" (Spanish: El Aleph) is a short story by Argentine writer and poet Jorge Luis Borges. First published in September 1945, it was reprinted in

"The Aleph" (Spanish: El Aleph) is a short story by Argentine writer and poet Jorge Luis Borges. First published in September 1945, it was reprinted in the short story collection The Aleph and Other Stories in 1949, and revised by the author in 1974.

Hebrew alphabet

Meir Kagan. In set theory, ? 0 {\displaystyle \aleph _{0}} , pronounced aleph-naught, aleph-zero, or aleph-null, is used to mark the cardinal number of

The Hebrew alphabet (Hebrew: ?????????? ???????,[a] Alefbet ivri), known variously by scholars as the Ktav Ashuri, Jewish script, square script and block script, is a unicameral abjad script used in the writing of the Hebrew language and other Jewish languages, most notably Yiddish, Ladino, Judeo-Arabic, and Judeo-Persian. In modern Hebrew, vowels are increasingly introduced. It is also used informally in Israel to write Levantine Arabic, especially among Druze. It is an offshoot of the Imperial Aramaic alphabet, which flourished during the Achaemenid Empire and which itself derives from the Phoenician alphabet.

Historically, a different abjad script was used to write Hebrew: the original, old Hebrew script, now known as the Paleo-Hebrew alphabet, has been largely preserved in a variant form as the Samaritan alphabet, and is still used by the Samaritans. The present Jewish script or square script, on the contrary, is a stylized form of the Aramaic alphabet and was technically known by Jewish sages as Ashurit (lit. 'Assyrian script'), since its origins were known to be from Assyria (Mesopotamia).

Various styles (in current terms, fonts) of representation of the Jewish script letters described in this article also exist, including a variety of cursive Hebrew styles. In the remainder of this article, the term Hebrew alphabet refers to the square script unless otherwise indicated.

The Hebrew alphabet has 22 letters. It does not have case. Five letters have different forms when used at the end of a word. Hebrew is written from right to left. Originally, the alphabet was an abjad consisting only of consonants, but is now considered an impure abjad. As with other abjads, such as the Arabic alphabet, during its centuries-long use scribes devised means of indicating vowel sounds by separate vowel points, known in Hebrew as niqqud. In both biblical and rabbinic Hebrew, the letters ? ? ? ? can also function as matres lectionis, which is when certain consonants are used to indicate vowels. There is a trend in Modern Hebrew towards the use of matres lectionis to indicate vowels that have traditionally gone unwritten, a practice known as full spelling.

The Yiddish alphabet, a modified version of the Hebrew alphabet used to write Yiddish, is a true alphabet, with all vowels rendered in the spelling, except in the case of inherited Hebrew words, which typically retain their Hebrew consonant-only spellings.

The Arabic and Hebrew alphabets have similarities in acrophony because it is said that they are both derived from the Aramaic alphabet, which in turn derives from the Phoenician alphabet, both being slight regional variations of the Proto-Canaanite alphabet used in ancient times to write the various Canaanite languages (including Hebrew, Moabite, Phoenician, Punic, et cetera).