An Mean

Mean

Arithmetic-geometric mean Arithmetic-harmonic mean Cesàro mean Chisini mean Contraharmonic mean Elementary symmetric mean Geometric-harmonic mean Grand mean Heinz mean Heronian

A mean is a quantity representing the "center" of a collection of numbers and is intermediate to the extreme values of the set of numbers. There are several kinds of means (or "measures of central tendency") in mathematics, especially in statistics. Each attempts to summarize or typify a given group of data, illustrating the magnitude and sign of the data set. Which of these measures is most illuminating depends on what is being measured, and on context and purpose.

The arithmetic mean, also known as "arithmetic average", is the sum of the values divided by the number of values. The arithmetic mean of a set of numbers x1, x2, ..., xn is typically denoted using an overhead bar,

x

‾

$$ {\displaystyle {\bar {x}}} $$

. If the numbers are from observing a sample of a larger group, the arithmetic mean is termed the sample mean (

x

‾

$$ {\displaystyle {\bar {x}}} $$

) to distinguish it from the group mean (or expected value) of the underlying distribution, denoted

?

$$ {\displaystyle \mu } $$

or

?

x

$$ {\displaystyle \mu _{x}} $$

.

Outside probability and statistics, a wide range of other notions of mean are often used in geometry and mathematical analysis; examples are given below.

Mean Girls

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Mean Girls is a 2004 American teen comedy film directed by Mark Waters and written by Tina Fey. It stars Lindsay Lohan, Rachel McAdams, Ana Gasteyer, Tim Meadows, Amy Poehler, and Fey. The film follows Cady Heron (Lohan), a naïve teenager who transfers to an American high school after years of homeschooling in Africa. Cady quickly befriends outcasts Janis and Damian (Lizzy Caplan and Daniel Franzese), with the trio forming a plan to exact revenge on Regina George (McAdams), the leader of an envied clique known as "the Plastics".

Fey conceived the idea for Mean Girls after reading the self-help book Queen Bees and Wannabes. The book describes female high school social cliques, school bullying, and the resulting damaging effect on teenagers. Fey also drew from her own experience at Upper Darby High School, in Upper Darby Township, Pennsylvania, as an inspiration for some of the film's concepts. Saturday Night Live creator Lorne Michaels served as a producer; Fey was a long-term cast member and writer for Saturday Night Live. Principal photography took place from September to November 2003. Although the film is set in the Chicago suburb of Evanston, Illinois, filming took place primarily in Toronto, Ontario.

Mean Girls premiered at the Cinerama Dome in Los Angeles on April 19, 2004, and was theatrically released in the United States on April 30, by Paramount Pictures. The film grossed over $130 million worldwide and received generally positive reviews from critics, who praised Waters's direction, Fey's screenplay, its humor, and the performances; especially lauded was Lohan's acting, which earned several accolades, including three Teen Choice Awards and two MTV Movie Awards, and in 2021, was listed as the eleventh-best performance of the 21st century by The New Yorker.

A made-for-television sequel, Mean Girls 2, premiered on ABC Family in January 2011. Mean Girls also spawned various adaptations, including a stage musical, which premiered on Broadway in March 2018, with a film adaptation released in January 2024.

Golden mean

Look up golden mean in Wiktionary, the free dictionary. Golden mean may refer to: Golden mean (philosophy), the felicitous middle between the extremes

Golden mean may refer to:

Golden mean (philosophy), the felicitous middle between the extremes of excess and deficiency

Golden mean (Judaism), a philosophy pertaining to body and soul in Jewish belief

Golden ratio, a specific mathematical ratio (sometimes called golden mean)

Golden ratio (mathematics and visual art)

The Golden Mean (1993), third novel in The Griffin and Sabine Trilogy by Nick Bantock

The golden-mean fallacy, another name for the argument to moderation

Doctrine of the Golden Mean, a chapter in Li Ji, one of the Four Books of Confucianism

Greenwich Mean Time

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Greenwich Mean Time (GMT) is the local mean time at the Royal Observatory in Greenwich, London, counted from midnight. At different times in the past, it has been calculated in different ways, including being calculated from noon; as a consequence, it cannot be used to specify a particular time unless a context is given. The term "GMT" is also used as one of the names for the time zone UTC+00:00 and, in UK law, is the basis for civil time in the United Kingdom.

Because of Earth's uneven angular velocity in its elliptical orbit and its axial tilt, noon (12:00:00) GMT is rarely the exact moment the Sun crosses the Greenwich Meridian and reaches its highest point in the sky there. This event may occur up to 16 minutes before or after noon GMT, a discrepancy described by the equation of time. Noon GMT is the annual average (the arithmetic mean) moment of this event, which accounts for the word "mean" in "Greenwich Mean Time".

Originally, astronomers considered a GMT day to start at noon, while for almost everyone else it started at midnight. To avoid confusion, the name Universal Time was introduced in 1928 to denote GMT as counted from midnight. Today, Universal Time usually refers to Coordinated Universal Time (UTC) or else to UT1; English speakers often use GMT as a synonym for UTC. For navigation, it is considered equivalent to UT1 (the modern form of mean solar time at 0° longitude); but this meaning can differ from UTC by up to 0.9 s. The term "GMT" should thus not be used for purposes that require precision.

The term "GMT" is especially used by institutional bodies within the United Kingdom, such as the BBC World Service, the Royal Navy, and the Met Office; and others particularly in Arab countries, such as the Middle East Broadcasting Centre and Dubai-based OSN.

Mean value theorem

In mathematics, the mean value theorem (or Lagrange's mean value theorem) states, roughly, that for a given planar arc between two endpoints, there is

In mathematics, the mean value theorem (or Lagrange's mean value theorem) states, roughly, that for a given planar arc between two endpoints, there is at least one point at which the tangent to the arc is parallel to the secant through its endpoints. It is one of the most important results in real analysis. This theorem is used to prove statements about a function on an interval starting from local hypotheses about derivatives at points of the interval.

Mean (disambiguation)

Look up mean or meán in Wiktionary, the free dictionary. Mean is a term used in mathematics and statistics. Mean may also refer to: Mean (album), a 1987

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Mean Girls (2024 film)

Mean Girls is a 2024 American teen musical comedy film directed by Samantha Jayne and Arturo Perez Jr. from a screenplay written by Tina Fey. It is based

Mean Girls is a 2024 American teen musical comedy film directed by Samantha Jayne and Arturo Perez Jr. from a screenplay written by Tina Fey. It is based on the stage musical of the same name, which in turn was based on the 2004 film (both also written by Fey), itself inspired by Rosalind Wiseman's 2002 book Queen Bees and Wannabes. It stars Angourie Rice, Reneé Rapp, Auli?i Cravalho, and Christopher Briney. Fey and Tim Meadows reprise their roles from the original film.

Paramount Pictures announced the film's development in January 2020, with Fey returning to write the screenplay and serve as a producer alongside Lorne Michaels, who produced the 2004 film. Composer Jeff Richmond and lyricist Nell Benjamin returned to rework their songs from the stage musical, while Richmond also composed the film's score. Casting began in December 2022. Principal photography took place in New Jersey between March and April 2023. Originally set for release on the streaming service Paramount+, Paramount Pictures opted to release the film theatrically after positive test screenings.

Mean Girls premiered at the AMC Lincoln Square in New York City on January 8, 2024, and was released in the United States by Paramount Pictures on January 12. The film grossed over $104 million worldwide on a $36 million budget and received mixed reviews.

Root mean square

In mathematics, the root mean square (abbrev. RMS, RMS or rms) of a set of values is the square root of the set's mean square. Given a set x i {\displaystyle

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Given a set

x

i

{\displaystyle x_{i}}

, its RMS is denoted as either

x

R

M

S

{\displaystyle x_{\mathrm {RMS} }}

or

R

M

S

x

{\displaystyle \mathrm {RMS} _{x}}

. The RMS is also known as the quadratic mean (denoted

M

2

$${\displaystyle M_{2}}}$$

), a special case of the generalized mean. The RMS of a continuous function is denoted

f

R

M

S

$${\displaystyle f_{\mathrm {RMS} }}$$

and can be defined in terms of an integral of the square of the function.

In estimation theory, the root-mean-square deviation of an estimator measures how far the estimator strays from the data.

Fréchet mean

In mathematics and statistics, the Fréchet mean is a generalization of centroids to metric spaces, giving a single representative point or central tendency

In mathematics and statistics, the Fréchet mean is a generalization of centroids to metric spaces, giving a single representative point or central tendency for a cluster of points. It is named after Maurice Fréchet. Karcher mean is the renaming of the Riemannian Center of Mass construction developed by Karsten Grove and Hermann Karcher. On the real numbers, the arithmetic mean, median, geometric mean, and harmonic mean can all be interpreted as Fréchet means for different distance functions.

Geometric mean

their geometric mean are plotted in logarithmic scale, the geometric mean is transformed into an arithmetic mean, so the geometric mean can equivalently

In mathematics, the geometric mean (also known as the mean proportional) is a mean or average which indicates a central tendency of a finite collection of positive real numbers by using the product of their values (as opposed to the arithmetic mean, which uses their sum). The geometric mean of ?

n

$${\displaystyle n}$$

? numbers is the nth root of their product, i.e., for a collection of numbers a1, a2, ..., an, the geometric mean is defined as

a

1

a

2

?

a

n

t

n

.

$$\sqrt[n]{a_{1}a_{2}\cdots a_{n}{\vphantom {t}}}.$$

When the collection of numbers and their geometric mean are plotted in logarithmic scale, the geometric mean is transformed into an arithmetic mean, so the geometric mean can equivalently be calculated by taking the natural logarithm ?

ln

$$\ln$$

? of each number, finding the arithmetic mean of the logarithms, and then returning the result to linear scale using the exponential function ?

exp

$$\exp$$

?,

a

1

a

2

?

a

n

t

n

=

exp

?

(

ln

$$\sqrt[n]{a_1 + \ln a_2 + \ln a_n}$$

$$\sqrt[n]{a_1 + \ln a_2 + \ln a_n}.$$

$${\displaystyle {\sqrt[{n}]{a_{1}a_{2}\cdots a_{n}{\vphantom {t}}}}=\exp \left({\frac {\ln a_{1}+\ln a_{2}+\cdots +\ln a_{n}}{n}}\right).}$$

The geometric mean of two numbers is the square root of their product, for example with numbers 2

$${\displaystyle 2}$$

2 and 8

$${\displaystyle 8}$$

8 the geometric mean is 2

2

8

=

$${\displaystyle \textstyle {\sqrt {2\cdot 8}}={}}$$

16

=

4

$${\displaystyle \textstyle {\sqrt {16}}=4}$$

. The geometric mean of the three numbers is the cube root of their product, for example with numbers ?

1

$${\displaystyle 1}$$

?, ?

12

$${\displaystyle 12}$$

?, and ?

18

$${\displaystyle 18}$$

?, the geometric mean is

1

?

12

?

18

3

=

$${\displaystyle \textstyle {\sqrt[{3}]{1\cdot 12\cdot 18}}={}}$$

216

3

=

6

$${\displaystyle \textstyle {\sqrt[{3}]{216}}=6}$$

.

The geometric mean is useful whenever the quantities to be averaged combine multiplicatively, such as population growth rates or interest rates of a financial investment. Suppose for example a person invests $1000 and achieves annual returns of +10%, ?12%, +90%, ?30% and +25%, giving a final value of $1609. The average percentage growth is the geometric mean of the annual growth ratios (1.10, 0.88, 1.90, 0.70, 1.25), namely 1.0998, an annual average growth of 9.98%. The arithmetic mean of these annual returns is 16.6% per annum, which is not a meaningful average because growth rates do not combine additively.

The geometric mean can be understood in terms of geometry. The geometric mean of two numbers,

a

$${\displaystyle a}$$

and

b

$${\displaystyle b}$$

, is the length of one side of a square whose area is equal to the area of a rectangle with sides of lengths

a

$${\displaystyle a}$$

and

b

$${\displaystyle b}$$

. Similarly, the geometric mean of three numbers,

a

$${\displaystyle a}$$

,

b

$${\displaystyle b}$$

, and

c

$${\displaystyle c}$$

, is the length of one edge of a cube whose volume is the same as that of a cuboid with sides whose lengths are equal to the three given numbers.

The geometric mean is one of the three classical Pythagorean means, together with the arithmetic mean and the harmonic mean. For all positive data sets containing at least one pair of unequal values, the harmonic mean is always the least of the three means, while the arithmetic mean is always the greatest of the three and the geometric mean is always in between (see Inequality of arithmetic and geometric means.)

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