

Infinity

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∞

, called the infinity symbol.

From the time of the ancient Greeks, the philosophical nature of infinity has been the subject of many discussions among philosophers. In the 17th century, with the introduction of the infinity symbol and the infinitesimal calculus, mathematicians began to work with infinite series and what some mathematicians (including l'Hôpital and Bernoulli) regarded as infinitely small quantities, but infinity continued to be associated with endless processes. As mathematicians struggled with the foundation of calculus, it remained unclear whether infinity could be considered as a number or magnitude and, if so, how this could be done. At the end of the 19th century, Georg Cantor enlarged the mathematical study of infinity by studying infinite sets and infinite numbers, showing that they can be of various sizes. For example, if a line is viewed as the set of all of its points, their infinite number (i.e., the cardinality of the line) is larger than the number of integers. In this usage, infinity is a mathematical concept, and infinite mathematical objects can be studied, manipulated, and used just like any other mathematical object.

The mathematical concept of infinity refines and extends the old philosophical concept, in particular by introducing infinitely many different sizes of infinite sets. Among the axioms of Zermelo–Fraenkel set theory, on which most of modern mathematics can be developed, is the axiom of infinity, which guarantees the existence of infinite sets. The mathematical concept of infinity and the manipulation of infinite sets are widely used in mathematics, even in areas such as combinatorics that may seem to have nothing to do with them. For example, Wiles's proof of Fermat's Last Theorem implicitly relies on the existence of Grothendieck universes, very large infinite sets, for solving a long-standing problem that is stated in terms of elementary arithmetic.

In physics and cosmology, it is an open question whether the universe is spatially infinite or not.

Avengers: Infinity War

Avengers: Infinity War is a 2018 American superhero film based on the Marvel Comics superhero team the Avengers. Produced by Marvel Studios and distributed

Avengers: Infinity War is a 2018 American superhero film based on the Marvel Comics superhero team the Avengers. Produced by Marvel Studios and distributed by Walt Disney Studios Motion Pictures, it is the sequel to The Avengers (2012) and Avengers: Age of Ultron (2015), and the 19th film in the Marvel Cinematic Universe (MCU). Directed by Anthony and Joe Russo and written by Christopher Markus and Stephen McFeely, the film features an ensemble cast including Robert Downey Jr., Chris Hemsworth, Mark Ruffalo, Chris Evans, Scarlett Johansson, Benedict Cumberbatch, Don Cheadle, Tom Holland, Chadwick Boseman, Paul Bettany, Elizabeth Olsen, Anthony Mackie, Sebastian Stan, Danai Gurira, Letitia Wright, Dave Bautista, Zoe Saldana, Josh Brolin, and Chris Pratt. In the film, the Avengers and the Guardians of the Galaxy attempt to stop Thanos from collecting the six powerful Infinity Stones as part of his quest to kill half

of all life in the universe.

The film was announced in October 2014 as *Avengers: Infinity War – Part 1*. The Russo brothers came on board to direct in April 2015, and a month later, Markus and McFeely signed on to write the script for the film, which draws inspiration from Jim Starlin's 1991 comic book *The Infinity Gauntlet* and Jonathan Hickman's 2013 comic book *Infinity*. In 2016, Marvel shortened the title to *Avengers: Infinity War*. Filming began in January 2017 at Pinewood Atlanta Studios in Fayette County, Georgia, with a large cast consisting mostly of actors reprising their roles from previous MCU films, including Brolin as Thanos. The production lasted until July 2017, shooting back-to-back with a direct sequel, *Avengers: Endgame* (2019). Additional filming took place in Scotland, the Downtown Atlanta area, and New York City. With an estimated budget of \$325–400 million, the film is one of the most expensive films ever made.

Avengers: Infinity War premiered at the Dolby Theatre in Hollywood, Los Angeles, on April 23, 2018, and was released in the United States on April 27 as part of Phase Three of the MCU. The film received positive reviews from critics, with praise for Brolin's performance and the Russo brothers' direction, as well as the visual effects, action sequences, dark tone, and musical score. It was a major box-office success, becoming the fourth film and the first superhero film to gross over \$2 billion worldwide, breaking numerous box office records, and becoming the highest-grossing film of 2018 and the fourth-highest-grossing film at the time of its release both worldwide and in the United States and Canada. It received a nomination for Best Visual Effects at the 91st Academy Awards, among numerous other accolades. The sequel, *Avengers: Endgame*, was released in April 2019.

Demon Slayer: Kimetsu no Yaiba – The Movie: Infinity Castle

Demon Slayer: Kimetsu no Yaiba – The Movie: Infinity Castle (Japanese: ??????????????, Hepburn: *Gekijō-ban Kimetsu no Yaiba: Mugen Jō-hen*) is a Japanese

Demon Slayer: Kimetsu no Yaiba – The Movie: Infinity Castle (Japanese: ??????????????, Hepburn: *Gekijō-ban Kimetsu no Yaiba: Mugen Jō-hen*) is a Japanese animated dark fantasy action film based on the "Infinity Castle" arc of the 2016–20 manga series *Demon Slayer: Kimetsu no Yaiba* by Koyoharu Gotouge. It is a direct sequel to the fourth season of the anime television series as well as its fourth, fifth, and sixth film adaptations, following *Mugen Train* (2020) and compilation films *To the Swordsmith Village* (2023) and *To the Hashira Training* (2024). It is directed by Haruo Sotozaki, produced by Ufotable, and written by the studio's staff members.

Unlike the *Swordsmith Village* and *Hashira Training* adaptations, which are compilation films, *Infinity Castle* is a feature-length multi-film adaptation due to the arc's content and dramatic pacing, similarly to *Mugen Train*. It is the first film of a trilogy that was first announced in June 2024, immediately following the airing of the fourth season's finale.

Formally titled *Demon Slayer: Kimetsu no Yaiba – The Movie: Infinity Castle – Part 1: Akaza Returns*, it was released in Japan on July 18, 2025, by Aniplex and Toho. It is scheduled to be released by Crunchyroll through Sony Pictures Releasing in select Asian countries in August, followed by a worldwide release in September. The film broke several box office records and grossed \$253.00 million worldwide in 38 days. It became the highest-grossing film of 2025 in Japan and the third highest-grossing film in the country's history.

Avengers: Endgame

Walt Disney Studios Motion Pictures, it is the direct sequel to Avengers: Infinity War (2018) and the 22nd film in the Marvel Cinematic Universe (MCU). Directed

Avengers: Endgame is a 2019 American superhero film based on the Marvel Comics superhero team the Avengers. Produced by Marvel Studios and distributed by Walt Disney Studios Motion Pictures, it is the direct sequel to *Avengers: Infinity War* (2018) and the 22nd film in the Marvel Cinematic Universe (MCU).

Directed by Anthony and Joe Russo and written by Christopher Markus and Stephen McFeely, the film features an ensemble cast which includes Robert Downey Jr., Chris Evans, Mark Ruffalo, Chris Hemsworth, Scarlett Johansson, Jeremy Renner, Don Cheadle, Paul Rudd, Brie Larson, Karen Gillan, Danai Gurira, Benedict Wong, Jon Favreau, Bradley Cooper, Gwyneth Paltrow, and Josh Brolin. In the film, the surviving members of the Avengers and their allies attempt to reverse Thanos's actions in *Infinity War* which erased half of all life in the universe.

The film was announced in October 2014 as *Avengers: Infinity War – Part 2*, but Marvel Studios later removed this title. The Russo brothers joined as directors in April 2015, with Markus and McFeely signing on to write the script a month later. It is a conclusion to the story of the MCU up to that point, ending the story arcs of several main characters. The film's plot revisits several moments from earlier films, bringing back actors and settings from throughout the franchise. Filming began in August 2017 at Pinewood Atlanta Studios in Fayette County, Georgia, shooting back-to-back with *Infinity War*, and ended in January 2018. Additional filming took place in the Metro and downtown Atlanta areas, the state of New York, Scotland, and England. The official title was announced in December 2018. With an estimated budget range of \$356–400 million, the film is one of the most expensive films ever produced.

Avengers: Endgame premiered at the Los Angeles Convention Center on April 22, 2019, and was released in the United States on April 26 as part of Phase Three of the MCU. The film received positive reviews from critics, with praise for its direction, acting, musical score, action scenes, visual effects, and emotional weight, with critics lauding its culmination of the 22-film story. It grossed \$2.799 billion worldwide, surpassing *Infinity War*'s entire theatrical run in eleven days and setting a number of box-office records. It was the highest-grossing film of all time from July 2019 to March 2021, before being surpassed again by the previous record-holder, *Avatar* (2009). *Endgame* was nominated for Best Visual Effects at the 92nd Academy Awards, among numerous other accolades. Two further films, *Avengers: Doomsday* and *Avengers: Secret Wars*, are scheduled for release in 2026 and 2027, respectively.

Infinity Stones

The Infinity Stones are fictional items in the Marvel Cinematic Universe (MCU) media franchise, based on the Infinity Gems of the Marvel Comics. As expounded

The Infinity Stones are fictional items in the Marvel Cinematic Universe (MCU) media franchise, based on the Infinity Gems of the Marvel Comics. As expounded across several interwoven MCU multimedia titles, the six Infinity Stones are reputed to embody and control essential aspects of existence—Space, Mind, Reality, Power, Time, and Soul—thereby making them critical artifacts in the MCU.

Thanos sets out to collect all six Stones to use them to wipe out half of all life in the universe, believing that his plan will save it from extinction. In 2018, Thanos accomplishes his goal and snaps his fingers while wearing the Infinity Gauntlet containing the Stones, causing the Blip. Thanos eventually uses the Stones again to destroy them and five years later, the surviving Avengers form a plan to go back in time to collect the Stones from other time periods to undo Thanos' snap. After defeating Thanos and undoing his actions from 2018, Steve Rogers / Captain America returns the Stones to the exact moments in time that the Avengers collected them from.

Despite being destroyed, the Stones make appearances in the Multiverse Saga, including in *Doctor Strange in the Multiverse of Madness* (2022) in an alternate universe where Thanos was defeated on his home planet of Titan by the Illuminati before he can collect all of the Stones. They also make appearances in several of the MCU television series on Disney+, between flashbacks in *WandaVision* (2021) and alternate universes in the first season of *Loki* (2021) and the animated series *What If...?* (2021–24). Scientific studies relating to the Stones have been conducted, mostly since the release of *Infinity War*, including one focusing on the control of matter.

Infinity Pool (film)

Infinity Pool is a 2023 science fiction body horror film written and directed by Brandon Cronenberg. The film stars Alexander Skarsgård, Mia Goth, and

Infinity Pool is a 2023 science fiction body horror film written and directed by Brandon Cronenberg. The film stars Alexander Skarsgård, Mia Goth, and Cleopatra Coleman. Set in the fictional country of Li Tolqa, it follows struggling novelist James Foster (Skarsgård) and his wife Em (Coleman), a couple on vacation at a seaside resort who, after meeting another couple and having dinner with them, discover the country's dark culture.

Cronenberg started developing the project in 2019, with production later being pushed back to 2021. Much of the cast joined the project that year and filming took place primarily in Budapest and Šibenik.

Infinity Pool premiered at the Sundance Film Festival on January 22, 2023, and was theatrically released in Canada on January 27, 2023, to critical acclaim, with particular praise for Goth's performance.

Infinity (disambiguation)

Look up infinitely, infinity, infinitude, illimitably, or ∞ in Wiktionary, the free dictionary. Infinity (symbol: ∞) is a mathematical

Infinity (symbol:

∞

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) is a mathematical concept that is involved in almost all branches of mathematics, and used in many scientific and non-scientific areas.

Infinity or infinities may also refer to:

Infinity Nikki

Infinity Nikki is a free-to-play action-adventure game with dress-up elements developed and published by Papergames (with publishing outside mainland

Infinity Nikki is a free-to-play action-adventure game with dress-up elements developed and published by Papergames (with publishing outside mainland China under Infold Games), which released for Android, iOS, PlayStation 5, and Microsoft Windows on 5 December 2024. It is the fifth installment in the Nikki series and a sequel to Shining Nikki. The game features open world exploration, platforming, and puzzle-solving.

Set in the world of Miraland, players accompany Nikki and her feline companion, Momo, on a quest to rescue a mystical god of wishes. Different outfits grant abilities for navigating diverse environments and solving challenges.

Infinity symbol

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The infinity symbol (∞) is a mathematical symbol representing the concept of infinity. This symbol is also called a lemniscate, after the lemniscate curves of a similar shape studied in algebraic geometry, or "lazy eight", in the terminology of livestock branding.

This symbol was first used mathematically by John Wallis in the 17th century, although it has a longer history of other uses. In mathematics, it often refers to infinite processes (potential infinity) but may also refer to infinite values (actual infinity). It has other related technical meanings, such as the use of long-lasting paper in bookbinding, and has been used for its symbolic value of the infinite in modern mysticism and literature. It is a common element of graphic design, for instance in corporate logos as well as in earlier designs such as the Métis flag.

The infinity symbol and several variations of the symbol are available in various character encodings.

Infinity Gems

The Infinity Gems (originally referred to as Soul Gems and later as Infinity Stones) are six fictional gems appearing in American comic books published

The Infinity Gems (originally referred to as Soul Gems and later as Infinity Stones) are six fictional gems appearing in American comic books published by Marvel Comics, named after and embodying various aspects of existence. The gems can grant whoever wields them various powers in accordance to the aspect of existence they represent, and have the potential of turning the wielder into a god-like being when the main six (Mind, Power, Reality, Soul, Space, and Time) are held together. Thus, they are among the most powerful and sought-after items in the Marvel Universe; playing important roles in several storylines, in which they were wielded by characters such as Thanos and Adam Warlock. Some of these stories depict additional Infinity Gems or similar objects. Although the Infinity Gems altogether give their user omnipotence, the Gems only function in the universe they belong to and not in alternate realities.

The Gems have appeared in several media adaptations outside of comics, including the Marvel Cinematic Universe film franchise, where they are called Infinity Stones and have their colors altered. These changes were later adapted into the comics.

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