

Mathematics in Movies

This is a collection of movie clips in which Mathematics appears.

All clips mentioned below are available for viewing along with additional tech. info. To access the flash version (.swf) or watch the quicktime file (.m4v) please go directly to the **author's** "Mathematics in Movies" web page at: http://www.math.harvard.edu/~knill/mathmovies/. Thank you.

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Hackers

Some mathematical formulas in a visualization of a "worm". Features a young Angelina Jolie and a good ol hexeditor which had already been useful to me on the Atari ST to "edit games". 1995

Intacto

What is the chance to draw an ace in a randomly shuffled card deck of 52. There is one chance in a million for a plane to crash and for it to crash, leaving you the only survivor out of how many – 237 passengers? One chance in 237 million. Later in this convoluted thriller, a Russian Roulette variant appears, where 5 of 6 chambers contain bullets. 2001





Some arithmetic problems on the blackboard, mostly with wrong solutions. 1996

Network

Arthur Jenson (played by Ned Beatty) talks to Howard Beale (played by Peter Finch) about the only primal force of nature: money: "What do you think the Russians talk about? Karl Max? They get out their linear programming charts statistical decision theories, mini-max solutions and compute the prize-cost probabilities of their transactions and investments. Just like we do. 1976



12 Monkeys

A wonderful performance of Brad Pit. Here he talks about predicting the future with a probability matrix. As expected with time travel stories, the storyline of 12 Monkeys is intriguing. 1995

The Maltese Falcon

Lots of meta talk and meta-meta talk and twisted logic in this conservation about the black bird. The statement "Mathematically correct" flagged the movie clip for this collection [I added the last remark to add a meta statement about this caption] 1941

Play the flash version (.swf). or watch the quicktime file (.m4v)

Suspect X (III) The end of a calculus class by Shigami. 2008







Amarcord Solving the quadratic equation. A math scene in this Fellini movie is part of a larger selection of delightful school scenes. 1973

Suspect X (IV)

The two friends talk about math, the four color theorem and the 7 Clay math problems. (Thanks to Li Zhou for the suggestion) 2008

Suspect X (II)

A physics class by Yukawa on quantum mechanics. 2008







Take this simple experiment using a Gaussian acceleration device

Suspect X (I)

The Gaussian Acceleration device appears early in this Japanese thriller. The entire movie is math/physics heavy since Yukawa is a physisist and Shigami is a mathematician. 2008



The Dam Busters

On the use of Congruent triangles to measure distances. Also some applied math problems on bouncing balls on water and detonations in water. Thanks to Craig Smorynski for the suggestion. 1955

Flipped

The area of a rhomboid. The movie clip of this beautiful love story starts a bit earlier, in order to explain why Juli Baker is so absent minded in school. 2010

Cranford

On addition of income numbers and a sentence on teaching mathematics or geography. [As all BBC drama, this miniseries contains delightful acting and is built on a wonderful script quite freely using Elizabeth Glaskells original text.] 2007

The Wild Blue Yonder

Rotating system. [Actual documentary footage and interviews are combined to a movie. The interview is real, the context makes it funny.] 2005

Deskset

The roof scene of this charming Tracy/Hepburn movie features some "mathematical" questions. (Thanks to Shawn Jones for the suggestion.) 1957

Artificial Intelligence: Al

About the fabric of space time and how humans have tried to find the meaning of life in art, poetry or mathematical formulas. 2001

In July

Theoretical and applied computation of a free fall problem (Thanks to Andrew Ranicki for the suggestion) 2000



Its when they say 2*2 is equal to 4, it is not numbers, it is space. It is perfect space. But only in your mind. You can not draw perfect squares in the material world. [While this movie scene is harmless, the movie itself is definitely not PG13.] 1997

The Bank

The multiplication table and the compound interest formula. 2005







The Wild Blue Yonder

Chaotic transport in the solar system. [Actual documentary footage and interviews are combined to a movie. The interview is real and serious but the context makes it funny.] Thanks to Martin Lo to mention this to me. Lo appeared with two other mathematicians in this movie. 2005

The killer inside me

A brief moment sanity in this dark, dark movie when Lou solves some integrals. It is an extremely disturbing movie because the dark side of Lou Ford, the psychotic killer, is not visible. Why the police men Lou does some math in this scene is unexplained in the movie. 2010

Rites of Love and Math

In this **MOVIE** of Edward Frenkel mathematical formulas are written onto skin. (Thanks to Andrew Ranicki for the suggestion). 2009

Drowning by Numbers

Counting the stars. Once you counted the hundred, all the other are the same. (Thanks to Andrew Ranicki for the suggestion). 1988













The Knack ... and How to Get It

The angle of incidence is equal to the angle or reflection (Thanks to Andrew Ranicki for the suggestion) 1965

A Serious Man

The Uncertainty Principle in Quantum Mechanics. The entire movie is a celebration of this principle starting with the dead/alive cat scene, unsharp boundaries singing and TV receiption, accepting mysteries, culture clashs, quantum tunneling between relationships etc,etc. One of the best Cohen brother movies. P.S. Can you spot the error in the blackboard computation in this scene? The computation error probably has been implemented also by purpose on a meta level. 2009

G.I. Joe - Rise of the Cobra

The shadow determines the lattitude where the picture was taken. Compare the idea of Eratostenes to measure the shadows of a stick on different locations to get the radius of the earth. Thanks to Robin Zaruba 2009



Time Machine

Mathematical work on a black board. 2002









Young Spock learns Math. He memorizes the formula (4pi/3) r³ for the volume of the sphere, the square root of 2396324 and the definition of dimensionality log(n)/log(d).

Star trek

2009







Star trek The Next generation

Probably the most hilarious statement about dimension in the galaxy appears in the episode "Where silence has Lease": "Is the lack of a dimension a dimension by itself?" Negative dimension. Mathematicians have not yet come up with this idea, but mathematicians have used also some time to come up with negative numbers. 2002

Up in the air

Ryan and Natalie have a candid conversation about numbers, frequent flyer milages mostly, "the miles are the goal" but "Pi is just a number" comes up too. 2009





Rain Man 3*82=246 = 250-4

(Thanks to loia Felice for the suggestion) 1988

Three O'Clock High

Some algebra problems are visible in a quiz. To determine who cheated, buddy has to solve 2 hlackhoard problems on square roots 1987

The Hangover

Mathematical thoughts of Allen, when winning at Vegas: from simple arithmetics to Fourier theory. How many formulas can you identify? 2009

Breaking the code

The enigma and its complexity appears in this movie about Alan Turing. Thanks to the university of Arizona movie club, where I had seen and learned about it. 1996

Star trek The Next generation

Barclay becomes a genius and argues Grand Unification Theory with Albert Einstein (Thanks to Jason Baumgartner for the suggestion) 2002



Flatland: The movie

Spherius shows Arthur the third dimension 2007







1965

obtained here.

Fermat's room

This brilliant movie is essentially about math only. A few famous math puzzles appear in this movie, where 4 mathematicians are trapped in a room where the walls slowly crush them. (Thanks to Evan Pellnitz for the suggestion).**MORE**.

Flatland (short) The sphere shows the third dimension. This movie was

done at the animation workshop at the Carpenter Center for the Visual Arts at Harvard University. A production

based on an idea by the American animator John Hubley (1914-1977) and directed by Eric Martin. (Thanks to

Jamie Clements for the suggestion). The movie can be

2007

Pay it forward

Powers of three in a good pyramid scheme: select 3 people to do good things for and then those 3 each select 3 more people, etc (Thanks to Carolyn Seubert for the suggestion). 2000





The Pink Panther Strikes Again

on a blackboard filled with wrong mathematical computations like 3x3=7. 1976

Bedazzled (2000)

The devil first assigns Fermats theorem but then cancels all homework. (Thanks to Tyson Liskow for the suggestion). 2000

Phantom Tollbooth

The dodecahedron asks some riddles to get to Digitopolis. Fibonnacci series, vectors and scalars, equivalence relations and 4827659 hairs. (Thanks to Ron Fisher for the suggestion) 1970

For a few dollars more

Counting dead gangsters. (Thanks to Damien Brown for the suggestion). 1965



Smilla's Sense of Snow

Smilla reads from Euclids book to Isaiah. (Thanks to Steen Grode for the suggestion) 1997

Smilla's Sense of Snow

Natural numbers, negative integers, fractions. An IMDB review quote: The absolute highlight of the movie is a little speech Smilla gives about numbers. (Thanks to Steen Grode for the suggestion) 1997

Butterfly Dreaming

On the probability that two raindrops hit the same leaf. (Thanks to Susan Milano for the suggestion and to Robert and Anna Pollack, and the movie director Rufus Williams to make the movie available). 2008







Reality Bites About the Math in Astronomy 1994

Merry Andrew

In this musical comedy, Danny Kaye as Merry Andrew teaches Newton's law, geodesics and Pythagoras (Thanks to Virginia Usnick for the suggestion) 1958

The Oxford Murders

Lecture on Wittgensteins pessimistic view on absolute truth followed by rather shallow sound bites: the beauty and harmony of numbers, the golden ratio, Fibonnacci, snowflakes and





October Sky

Free fall differential equations as used in rocketry. 1999

Run Lola Run

Beside the main theme of "sensitive dependence on initial conditions", there is a "run of Lola" in which she wins in roulette twice betting on the same number 20. The first time, the initial input of 100 mark is multiplied by 35. The second bet multiplies the now 3600 by 35 leading to a total win of 3500+126'000 = 129'500 has an element of Grass's Blechtrommel cry, mathematically related to "resonance". (Thanks to Mark-Willem Dogterom). 1998



A tutoring scene with equilateral and isosceles triangles. (Thanks to R. Star Behar for the suggestion) 2002





cancer, the secret meaning of numbers, the butterfly which flaps its wings to produce a hurricane which nobody can predict, logic and chance. Thanks to Detlev Beutner for the suggestion. 2008

Little Big Man

A lier dilemma leads to the defeat of general Coster at the battle of big horn (Thanks to Virginia Usnick for the suggestion). 1970

lts a Mad,mad world

Some division problems appear in this oscar winning comedy when eight motorists try to figure out how to split the not yet found treasure. (Thanks to Pete Swartz for the suggestion) 1963



only shows shots of Harvard college but also some rather tough math test problems: like Harriot's method of solving cubics (named after Thomas Harriot, you find

Harriot, you find Harriot's method for finding the three solutions $x=-b^2/e,e,b^2/e$ of the equation x^3+3 $b^2 x = 2 c^3$ here). Also Diophantine equations or integration problems appear in this test.

Shrek the Third

2003

Mathematical logic in sentences 2007

Apocalypse Now

Surrounded by horror, forms of poetry, physics and math appear in a mad form too. Photojournalist: "this is dialectics. It is very simple dialectics: 1 through 9, no maybes, no supposes, no fractions. You can't travel to space. You can not go to space with fractions. What do you land on: on









Last year in Marienbad

In this rather enigmatic movie, the enigmatic game of NIM with a 7-5-3-1 initial condition is played twice. (Thanks to John Boller for the suggestion.) 1961

The Happening

During one of the "happenings", Julian tries to divert the attention to a math problem. 2008



		one quarter or 3/8th? What do you do when you go to venus or something. Thats dialectic. Physics. Dialectic logic is: there is only love or hate."
Now then. The bathfub holds 100 gallons.	How green was my valley A 100 gallon bath tub is filled from A with 20 gal/min and from B with 10 gal/min and leaks 5 gal/min. How long until it fills? Thanks to Orlando Figueiredo for the suggestion. 1941	Alice in Wonderland [IMDb link] Riddle: Why is a raven like a writing desk? Carols own answer given in 1896: Because it can produce a few notes, tho they are very flat; and it is nevar put with the wrong end in front! (Thanks to Tania Moloney for the suggestion). 1951
	Alice in Wonderland Fooling around with complements. The unbirthday. Its a small world, most people share an unbirthday. Carol might have been inspired by the birthday paradox: in a class of 23 the chance to have two kids with the same birthday is already more than 1/2. (Thanks to Tania Moloney for the suggestion). 1951	National Treasure Cracking a password by knowing the letters used. 2004
	National Treasure Code The Ottendorf Cipher, a book Cipher. 2004	The wizard of oz The scare crow theorem: in an isoscele triangle, the sum of the square roots of two sides is the square root of the third side. (Thanks to Wyley Beatty to suggest this movie). 1939 Play the flash version (.swf). or watch the quicktime file (.m4v)
	The number 23 Numerology with the number 23 2007	23 A true story about German Hackers/Spies. Numerology as in the movie "The number 23". Bach as a hacker composing palindromic music. (Thanks to Frank Josellis for the suggestion). 1998
	Antonia's Line An algebraic topology class. (Thanks to Mark Barsamian for the suggestion). 1995	21 The Newton method 2008
	21 Cauchy plagiarism? 2008 Play the flash version (.swf). or watch the quicktime file (.m4v)	Collossus: The Forbin Project The mighty US defense computer "Colossus" develops calculus to communicate with its buddy in the Soviet union. (Thanks to website visitor "Bob" to

	suggest this.) 1970
The bank Predicting the stock market using complex dynamics. 2001	Little Big League Joe can paint the house in a=5 hours, Sam can paint the house in b=3 hours. How much time do they need if the paint it together? 1994
The Office: Season 5 Epiosde 9 Explaining a surplus to a 5 year old. 2008	Revolutionary Road A mathematician appears in this though provoking movie. 2008
Harold and Kumar Solving an integration problem in calculus 2008	Harold and Kumar A poem about the number square root of 3. (Thanks to Yelena Melnichenko for pointing out that math scene). 2008
Back to the Future Part III Dok Brown: Clara was one in a million, one in a billion, one in a googolplex. 1990	Once upon a time in the west Counting horses 1968
Once upon a time in the west Thousands of Thousands. One calls them Millions 1968	Jane Eyre (I) Some glimpses of mathematics appear in the BBC drama: Jane Eyre tutors fractions to Adele who is later very excited about the carriage. 2006
Jane Eyre (II) An other glimpses of mathematics appear in the BBC drama: Jane Eyre grades a fraction assignment of Adele and is interrupted by Grace Pool. 2006	Jane Eyre (III) An other glimpses of mathematics: a happy carriage scene, Rochester imagines Jane teaching mathematics. 2006
The Tenant of Wildfell Hall A glimpse of geometry in painting? 1996	Mansfield Park Reciting a scene with Fanny, Edmund and Mary, mentioning the teaching of mathematics. As frequently done by Jane Austen, the scene is also a play in a play where the dialog refers to the actual situation. An other most delightful example (not displayed in this clip) is the library scene when Sir Thomas unexpectedly comes home from Antigua. 1996

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	The prophecy Simon: "See you kids. Study math. Its the key to the universe". (thanks to Bret Benesh for the suggestion). 1995	Father of the bride How to get 8 hotdogs and 8 hotdog buns if hotdog buns are bundled in 12. (Thanks to website visitor Renee Pentecost to suggest this). 1991
	Mean Girls A scene showing a Highschool calculus class. (thanks to website visitor Lillian Tubbs to suggest this.) 2004	Mean Cirls A scene showing a calculus contest in which a system of linear equations as well as a limit problem appears (thanks to website visitor Lillian Tubb: to suggest this.) 2004
	The Clan of the Cave Bear Teaching of mathematics at the time of the Neanderthals maybe 100'000 years ago. 1986	Bedazzled (1967) The lier's paradox in this Faustian comedy in which Elliot sold his soul to have 7 wishes fulfilled. 1967
	The code conspiracy The ulam prime spiral appears. One could overlook that almost nothing connected with codes, physics or math does make sense in this movie, but that the blue picture of the Ulam spiral is fake is slightly annoying. 2001	The island Discovering a deterministic system for the lottery on the island. 2005
	Good Neighbors, episode 1.1 Tom Goods remembers to use Algebra to solve things. Introduce x as the unknown. 1975	Cast Away [IMDb link] First scene: Lecture on search area on a rock. Second scene the path of the sur on the rock used a a calendar. 2000
	Eleventh hour: Kryptos Ian Hood, the special scientific troubleshooter for the British government has to solve a riddle from a friend. (Thanks to Robin Zaruba for the suggestion) 2006	Marius Bartender Cesar lectures Marius on mixing a picon- citron-curacao: on- very small third of curacao, one third of citron, then a large third of picon And to finish, a large third of water (Movie suggested by Billy Carson) 1931
	The Croupier About the odds in poker. 1998 Play the flash version (.swf). or watch the quicktime file (.m4v)	Ma and Pa Kettle Different proofs that 25/5 = 14 1949
	Cube People are trapped in a giant cube puzzle. A permutation riddle has to be solved. 1997	Hypercube People are trapped in a hypercube which implodes at the end. Also time is mixed up in this cube.



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The Saint Piece of paper with mathematical formulas for cold fusion. 1997	Indiana Jones and the Raiders of the Lost Ark Blackboard with some physics formulas 1981
Good Will Hunting, Cayley formula Will Hunting writes down Cayley's formula stating that the number of labeled trees on n nodes is n ⁿ⁻² . Then lists 8 different unlabeled trees with 10 nodes. (Thanks to George Lowe for the suggestion) 1997	Good Will Hunting A Blackboard in linear algebra lecture at MIT on Parseval's identity in Fourier theory. 1997
A Beautiful Mind Multivariable calculus lecture 2001	Dimensions An educational movie by Jos Leys Etienne Ghys and Aurelien Alvarez (Thanks to Pedram Safari for suggesting this) 2008
Donald in Mathmagicland Donald learns the Math of Billiards 1959	The Mirror has two Faces Calculus lecture but the actors mumble about prime twins. 1996
Infinity Abakus scene and explanation how to compute the third roots 1996	Jurassic park Chaos theory I 1993
Jurassic park Chaos theory II 1993	Contact Information is encoded in a cube 1997
Contact Prime numbers as contact (thanks to Misha Tiberend for suggesting this). 1997	Like Mike Supersized triangles (Thanks to Cheryl McDuff for the suggestion) 2002
Big Josh helps a kid with algebra 1988	Good Night, Mr Bean watches chess game and counts sheep addition problem to go to sleep 1995

Back to the Future Part III Dok Brown: Clara was one in a million, one in a billion, one in a googolplex. 1990	Mission Impossible III Pendulum swing (Thanks to Lesa Vandiver for the suggestion) 2006
The Count of Monte Cristo I offer something priceless. I offer knowledge. Abbe Faria teaches Edmond Dantesphilosophy, mathematics and economics. 2002	Clueless The math problem 7x7 1995
The Da Vinci Code The Fibonnacci sequence 1 1 2 3 5 8 13. 2006	Chaos The popular book of James Gleick on Chaos 2005
Casino Royale Some mathematical themes and patterns motivated by mathematics appear in the intro 2006	Mr. Hollands Opus If I'm forced to choose from Mozart or Reading and Writing and Long divisions, I choose long division You can cut the arts, but the kids will have nothing anymore to read and write about. 1995
Numb3rs (intro to pilot) Mathematics is everywhere. It is also used to solve crimes. 2005	Numb3rs (pilot) Using statistics to find location of criminal and the odds to win the lottery. 2005
	Yakitate Japan episode 40 Encoding a message as a number to base 26. (Thanks to visitor Chu-Wee Lim to suggest this). 2004
Die hard III (St Ives) The classic St Ives riddle 7x7x7x7. (Thanks to Cheryl McDuff for the suggestion) 1995	Die hard III (bottle) A classic water bottle riddle. How to produce exactly 4 gallons with a 3 and a 5 gallon pan. (Thanks to Cheryl McDuff for the suggestion) 1995

Fahrenheit 451 Gray suited students recite multiplication tables.



Caddyshack In one physical model, the shortest distance between two points is a straight line - in the opposite direction. 1980

Links

Here are some references and links to other collections.

- entry [PDF] of Sofia project
- http://world.std.com/~reinhold/mathmovies.html
- http://members.aol.com/vlorbik/tenpage/movies.html
- http://www.pbs.org/teachersource/mathline/concepts/movies.shtm
- http://www.math.tamu.edu/~dallen/hollywood/mathindex.htm
- Math in the movies for middle and high school teachers
- The Countdown resource is a multimedia math education initiative
- Simpsons Math
- Education notes by Edmond Barbeau, Toronto

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