August 2025

Dr Andrew French

FROM THE MAKERS OF WOLFRAM LANGUAGE AND MATHEMATICA

WolframAlpha

answer to life, the universe, and everything

NATURAL LANGUAGE | MATH INPUT | EXTENDED KEYBOARD | EXAMPLES | UPLOAD | RANDOM

Assuming Answer to the Ultimate Question of Life, the Universe, and Everything | Use Now, here's the meaning of life. Thank you, Brigitte. instead

Input interpretation

Answer to the Ultimate Question of Life, the Universe, and Everything

Result

42

(according to the book *The Hitchhiker's Guide to the Galaxy*, by Douglas Adams)

Google

what is the answer to life the universe and everything

AI Mode | All | Images | Videos | Short videos | Shopping | News | More | Tools

People also ask

Why is 42 the answer to life and everything?

Is the meaning of life actually 42?

What is 42 in life?

What is the first line of The Hitchhiker's Guide to the Galaxy?

Feedback

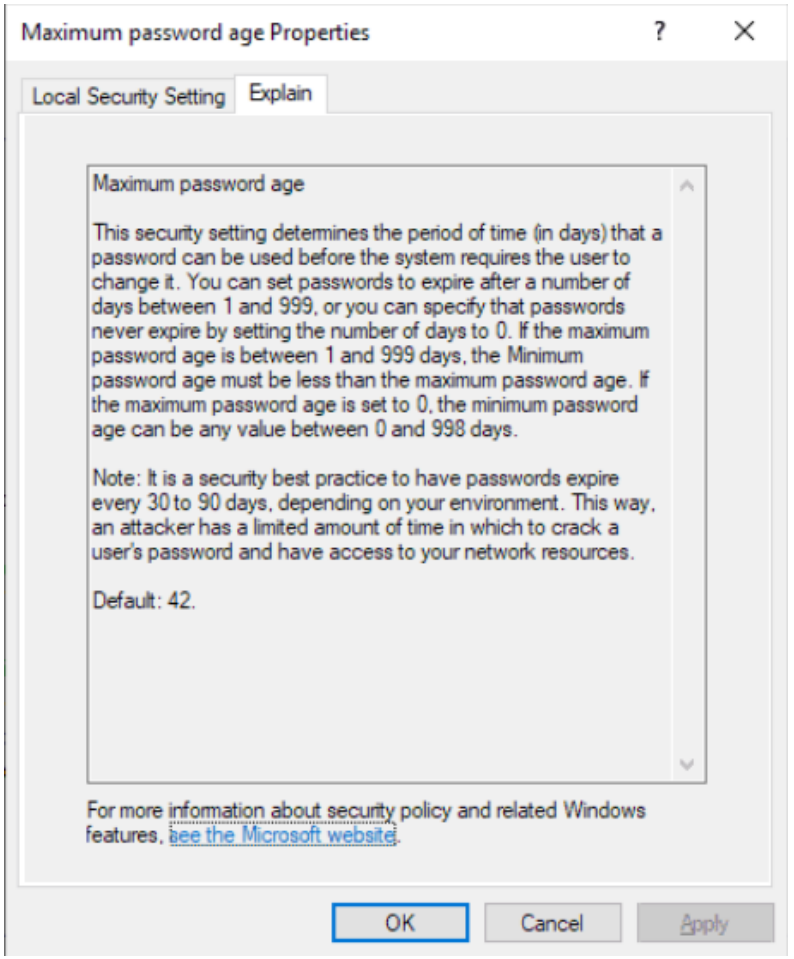
The answer to life the universe and everything =

42

Rad	Deg	x!	(	)	%	AC
Inv	sin	ln	7	8	9	÷
π	cos	log	4	5	6	×
e	tan	√	1	2	3	−
Ans	EXP	x^y	0	.	=	+

Maths solver

Feedback



reddit

r/activedirectory • 6 yr. ago
spawrage

Why did M$ set the default max age of passwords to 42 days?

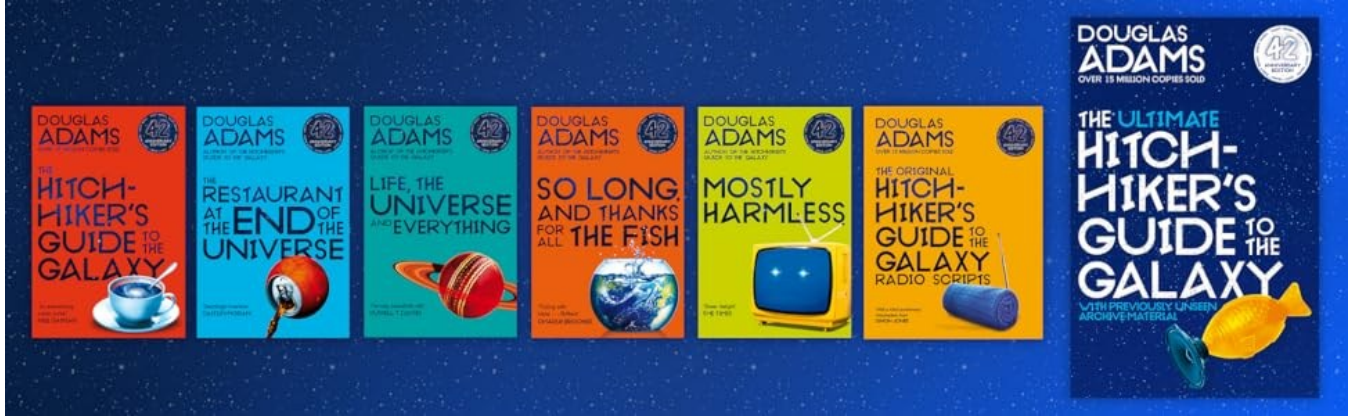
"Best practices: Set Maximum password age to a value between 30 and 90 days"

So why not 30? Why not 90? Why not 60 which is in the middle unlike 42?

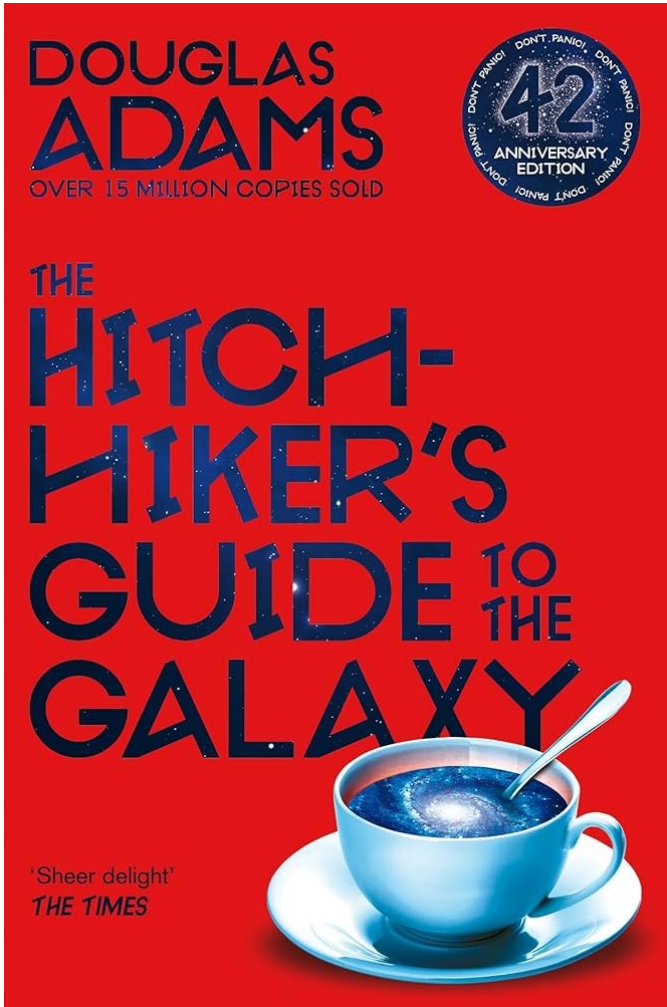
vecernik87 • 4y ago

because 42 is the answer to the ultimate question of life, the universe, and everything

Douglas Adams
(1952-2001)



Don’t panic!




Deep Thought, after a 7.5 million year calculation ...
Yes, I thought it over quite thoroughly. It's 42.

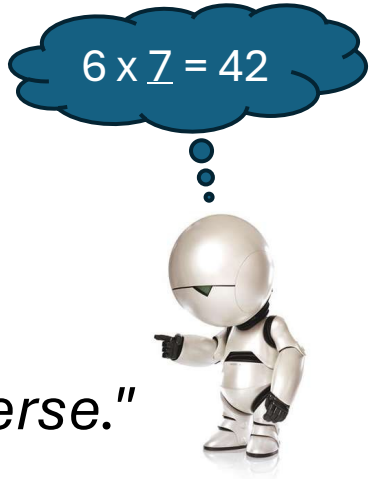
At the end of the radio series, the television series and the novel ***The Restaurant at the End of the Universe***, **Arthur Dent,** having escaped the Earth's destruction, attempts to discover **The Ultimate Question** by extracting it from his brainwave patterns, when a Scrabble-playing caveman spells out **"forty two".** Arthur pulls random letters from a bag, but only gets the sentence:

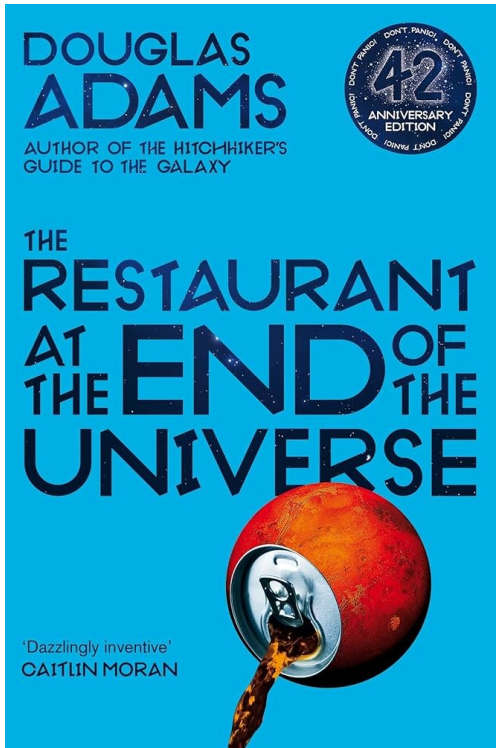
"What do you get if you multiply six by nine?"

"Six by nine. Forty two."

"That's it. That's all there is."

"I always thought something was fundamentally wrong with the universe."





Hang on a minute!

$$6 \times 9 = 54$$

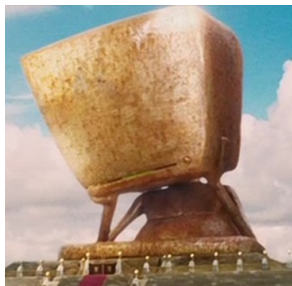
not 42 ..... Or is it?

$$4 \times 13^1 + 2 \times 13^0 = 54$$

42 in **BASE-13** is **54** in **BASE-10** ...

$4 \times 13^1 + 2 \times 13^0 = 54$

$5 \times 10^1 \times 4 \times 10^0 = 54$



It's so obvious

42 Decimal

$= 4 \times 10^1 + 2 \times 10^0$

$= 101010$ Binary

$= 1 \times 2^5 + 0 \times 2^4 + 1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 0 \times 2^0$

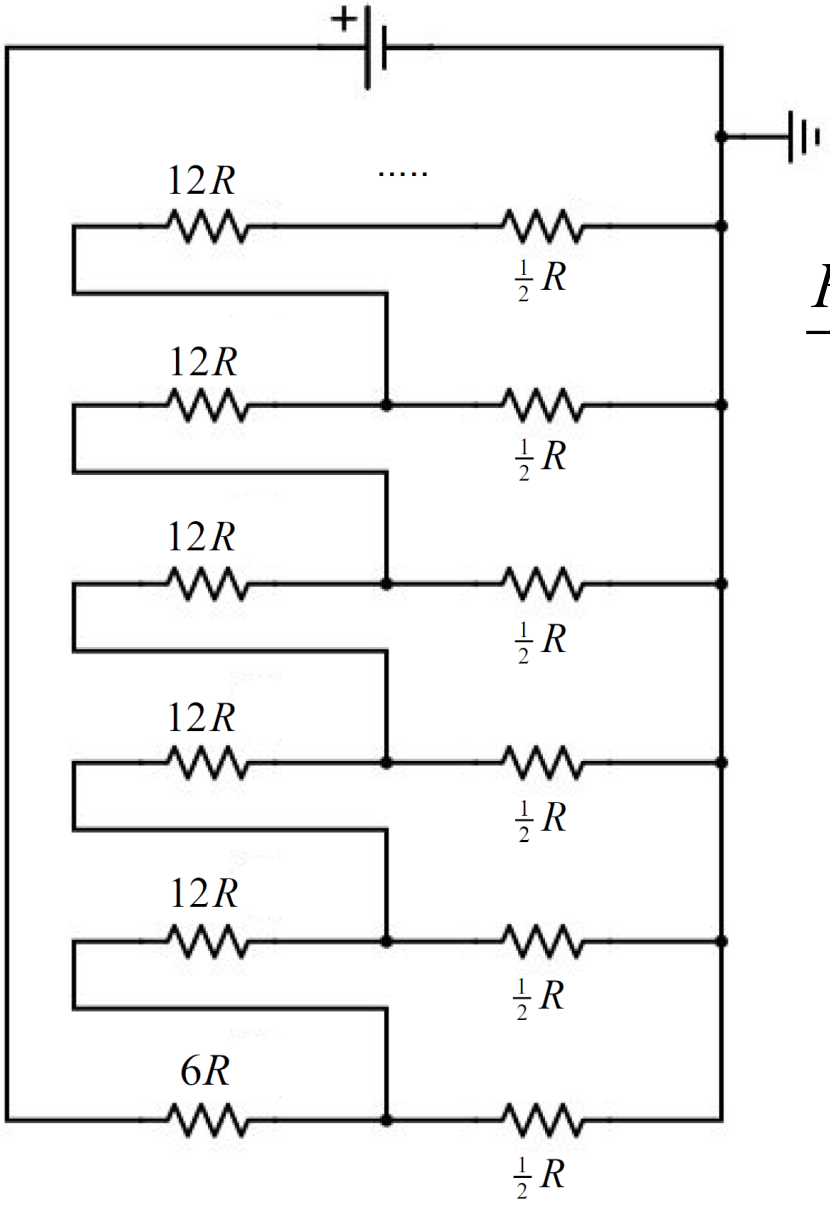
$= 32 + 0 + 8 + 0 + 2 + 0$

42 = 101010

Decimal

Binary

The Circuit of Deep Thought (!)



$$R_{\text{total}} \to \sqrt{42}R$$

This is the 'root' of my many, many microprocessors

$$\frac{R_{total}}{R} = x = 6 + \cfrac{1}{2 + \cfrac{1}{12 + \cfrac{1}{2 + \cfrac{1}{12 + \cfrac{1}{2 + \ldots}}}}}$$

$$\therefore x + 6 = 12 + \cfrac{1}{2 + \cfrac{1}{x+6}}$$

$$\therefore x = 6 + \frac{x+6}{2x+13} = \frac{12x + 78 + x + 6}{2x+13}$$

$$\therefore 2x^2 + 13x = 13x + 84$$

$$\therefore \boxed{x^2 = 42}$$

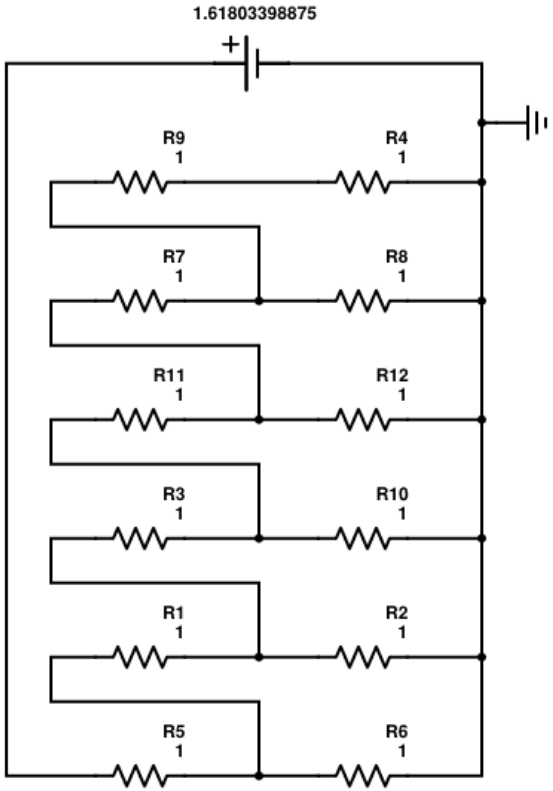
$$\frac{R_{total}}{R} = \phi = 1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \ldots}}}}}} = 1 + \frac{1}{\phi}$$

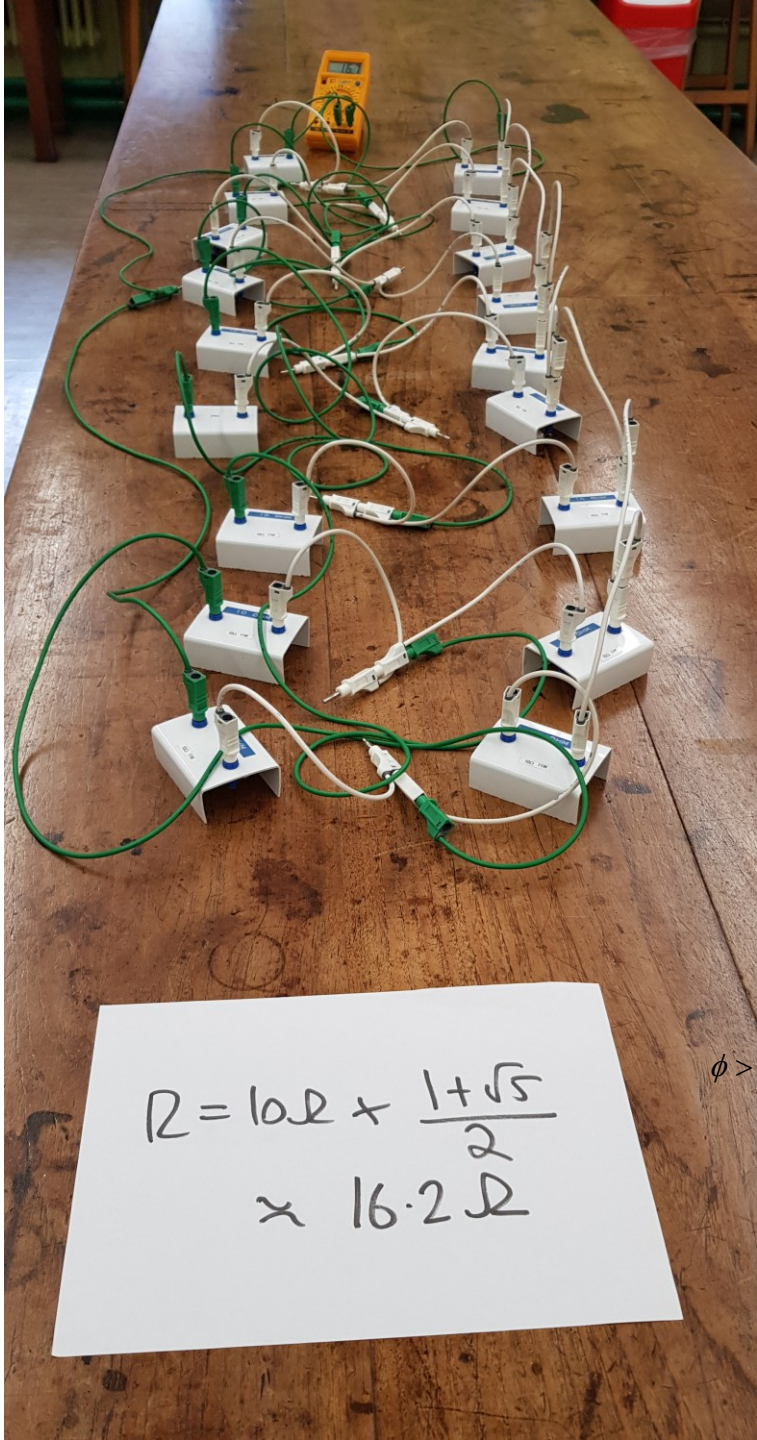
$$\therefore \phi^2 = \phi + 1 \Rightarrow \phi^2 - \phi - 1 = 0$$

$$\therefore \left(\phi - \tfrac{1}{2}\right)^2 - \tfrac{1}{4} - 1 = 0$$

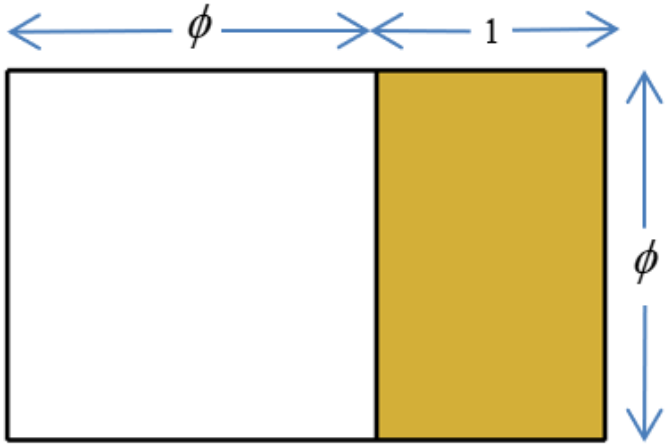
$$\boxed{\phi = \frac{1+\sqrt{5}}{2}}$$

The Golden Circuit





Golden Rectangle and Golden Ratio



$$\frac{\phi}{1} = \frac{1+\phi}{\phi} =$$

$$\phi^2 = 1+\phi$$

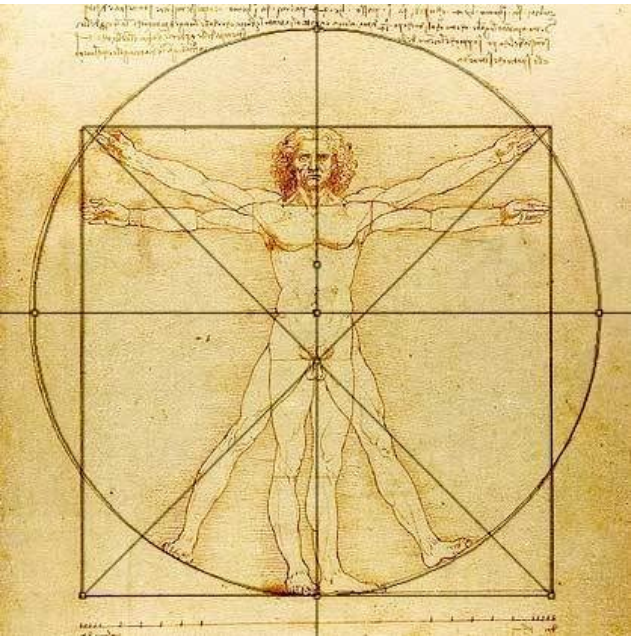
$$\phi^2 - \phi - 1 = 0$$

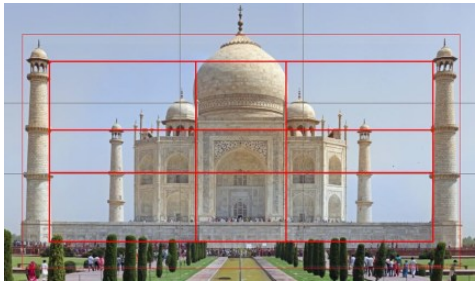
$$\left(\phi - \tfrac{1}{2}\right)^2 - \tfrac{1}{4} - 1 = 0$$

$$\phi = \tfrac{1}{2} \pm \tfrac{\sqrt{5}}{2}$$

If we assert that $\phi > 1$ we can take the positive root

$$\phi = \tfrac{1}{2}\left(1+\sqrt{5}\right)$$





Fibonacci series and the Golden Ratio

The *Fibonacci series* is determined by the iteration:

$$F_0 = 0,\ F_1 = 1$$
$$F_n = F_{n-1} + F_{n-2}$$

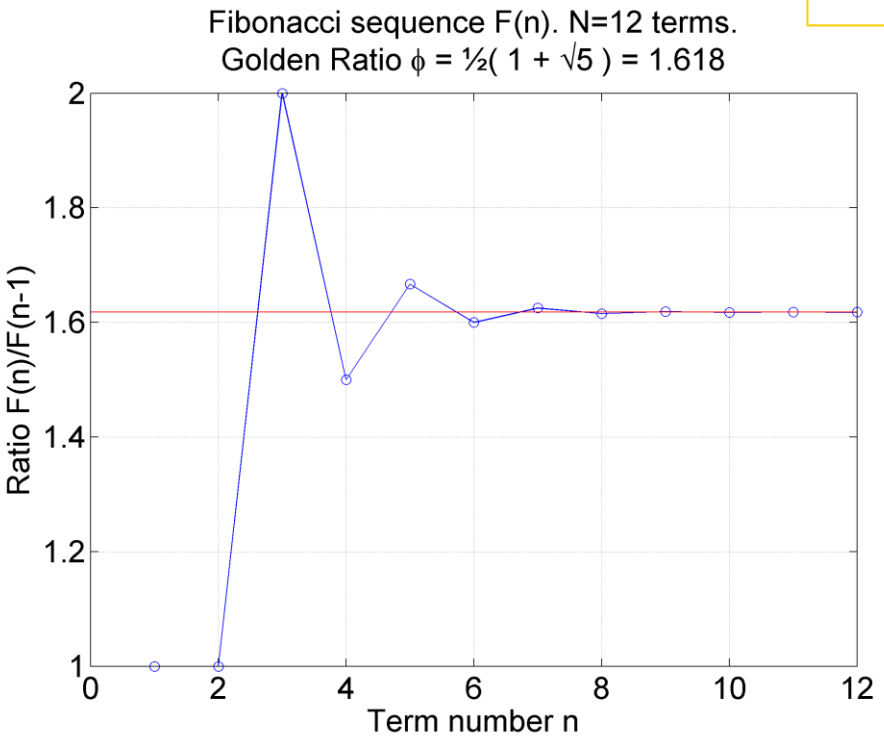
```
n = 1,   F(1) = 1,     R(1)  = 1
n = 2,   F(2) = 1,     R(2)  = 1
n = 3,   F(3) = 2,     R(3)  = 2
n = 4,   F(4) = 3,     R(4)  = 1.5
n = 5,   F(5) = 5,     R(5)  = 1.6667
n = 6,   F(6) = 8,     R(6)  = 1.6
n = 7,   F(7) = 13,    R(7)  = 1.625
n = 8,   F(8) = 21,    R(8)  = 1.6154
n = 9,   F(9) = 34,    R(9)  = 1.619
n = 10, F(10) = 55,    R(10) = 1.6176
n = 11, F(11) = 89,    R(11) = 1.6182
n = 12, F(12) = 144,   R(12) = 1.618
```

Leonardo Fibonacci
1170-1250

The ratio of sequential terms, R, converges towards the **Golden Ratio** ϕ.

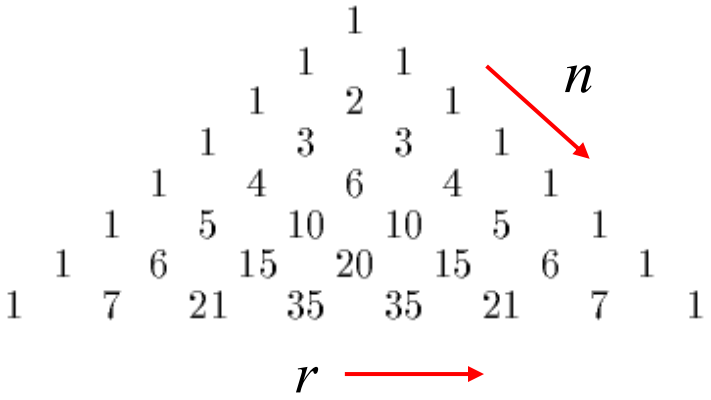
$$\phi = \tfrac{1}{2}\left(1+\sqrt{5}\right) \approx 1.618$$

Jacques Binet
1786-1856



Binet's Formula can be used to determine the n^{th} term of the Fibonacci series:

$$F_n = \frac{\phi^n - (1-\phi)^n}{\sqrt{5}}$$



Binomial coefficients

$$\binom{n}{r} = \frac{n!}{(n-r)!r!}$$

42 is a **Catalan number**

$$C_n = \frac{1}{n+1}\binom{2n}{n} = \frac{(2n)!}{(n+1)!n!}$$

1, 1, 2, 5, 14, **42**, 132, 429, 1430, 4862, 16796, 58786, …

$$C_5 = \frac{1}{5+1}\binom{2\times 5}{5} = \frac{(2\times 5)!}{(5+1)!5!} = \frac{10!}{6!5!} = 42$$

International Mathematics Olympiad

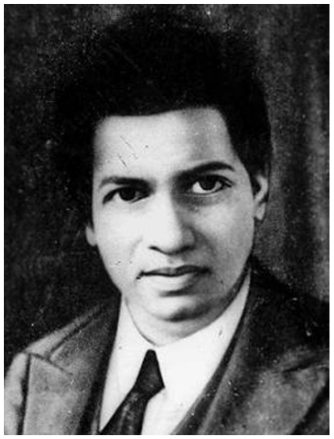
42 is an IMO perfect score

- IMO held over two days
- 4.5 hours per day for 3 problems
- 7 points for each of 6 problems

https://en.wikipedia.org/wiki/International_Mathematical_Olympiad

DD	MM	CC	YY
YY $+1$	CC -1	MM -3	DD $+3$
MM -2	DD $+2$	YY $+2$	CC -2
CC $+1$	YY -1	DD $+1$	MM -1

Birthday Magic Square



[Srinivasa Ramanujan](#)

1887-1920

Born 22/12/1887

$$1729 = 1^3 + 12^{13} = 9^3 + 10^3$$

Hardy-Ramanujan number

2	4	20	16	42
17	19	1	5	42
2	4	18	18	42
21	15	3	3	42
42	42	42	42	42

8	25	9	42
15	14	13	42
19	3	20	42
42	42	42	42

$$a = 5$$

$$b = 6$$

$$c = 14$$

$$3c = 42$$

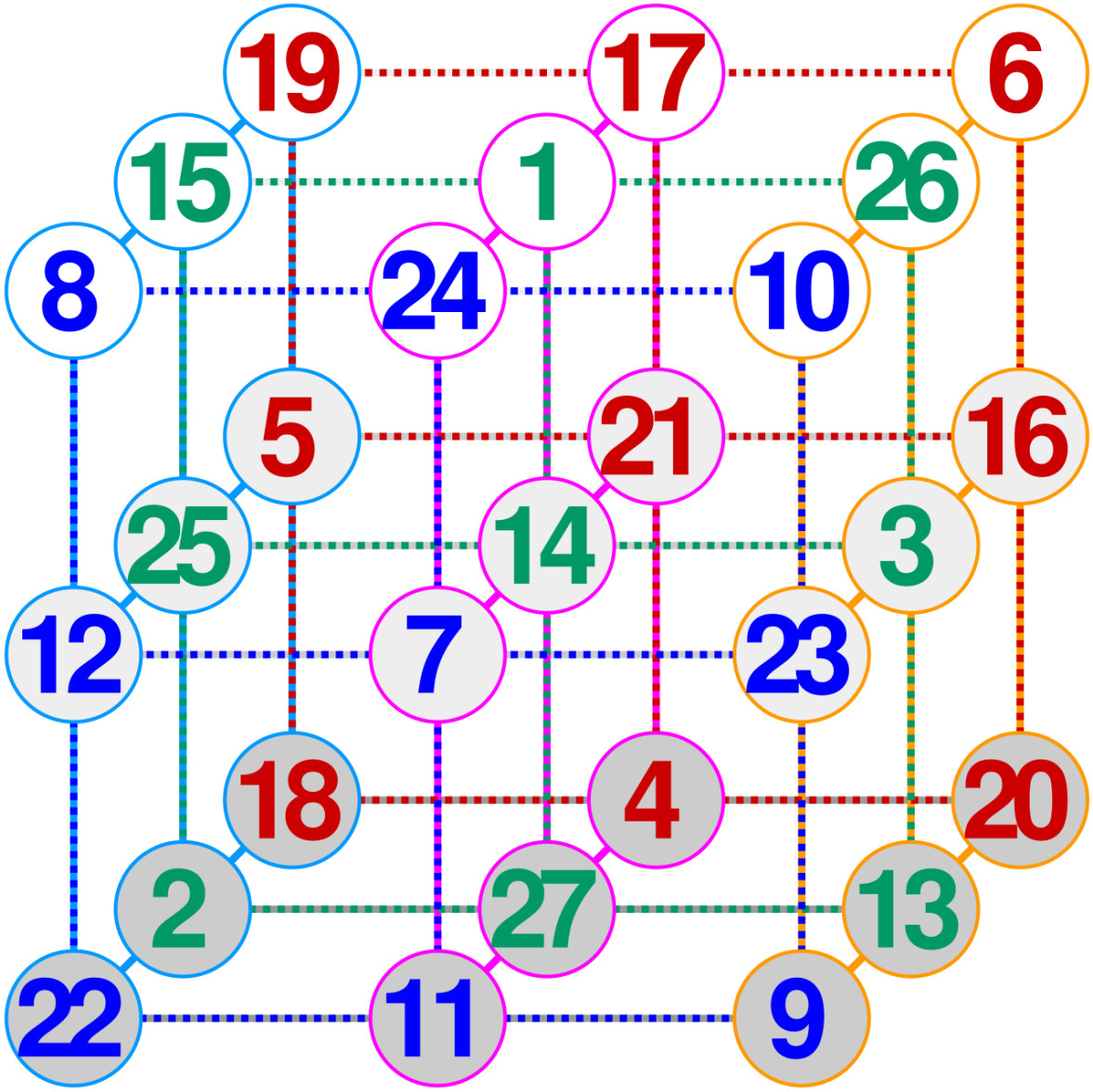
$$a + b = 11$$

Édouard Lucas

1842-1891

$$c > a + b$$

$c - b$	$a + b + c$	$c - a$
$b + c - a$	c	$a - b + c$
$a + c$	$c - a - b$	$b + c$



Magic cube with all three adjacent numbers adding to 42

Wolfram MathWorld FROM THE MAKERS OF MATHEMATICA AND WOLFRAM|ALPHA

Search

Number Theory › Numbers › Small Numbers ›
Recreational Mathematics › Mathematics in the Arts › Mathematics in Literature › The Hitchhiker's Guide to the Galaxy ›

42

According to the novel *The Hitchhiker's Guide to the Galaxy* (Adams 1997), 42 is the ultimate answer to life, the universe, and everything. Unfortunately, it is left as an exercise to the reader to determine the actual question.

On Feb. 18, 2005, the 42nd Mersenne prime was discovered (Weisstein 2005), leading to humorous speculation that the answer to life, the universe, and everything is somehow contained in the 7.8 million decimal digits of that number.

It is also amusing that 042 occurs as the digit string ending at the 50 billionth decimal place in each of π and $1/\pi$, providing another excellent answer to the ultimate question (Berggren *et al.* 1997, p. 729).

https://mathworld.wolfram.com/news/2005-02-26/mersenne/

$$2^{25964951}-1$$

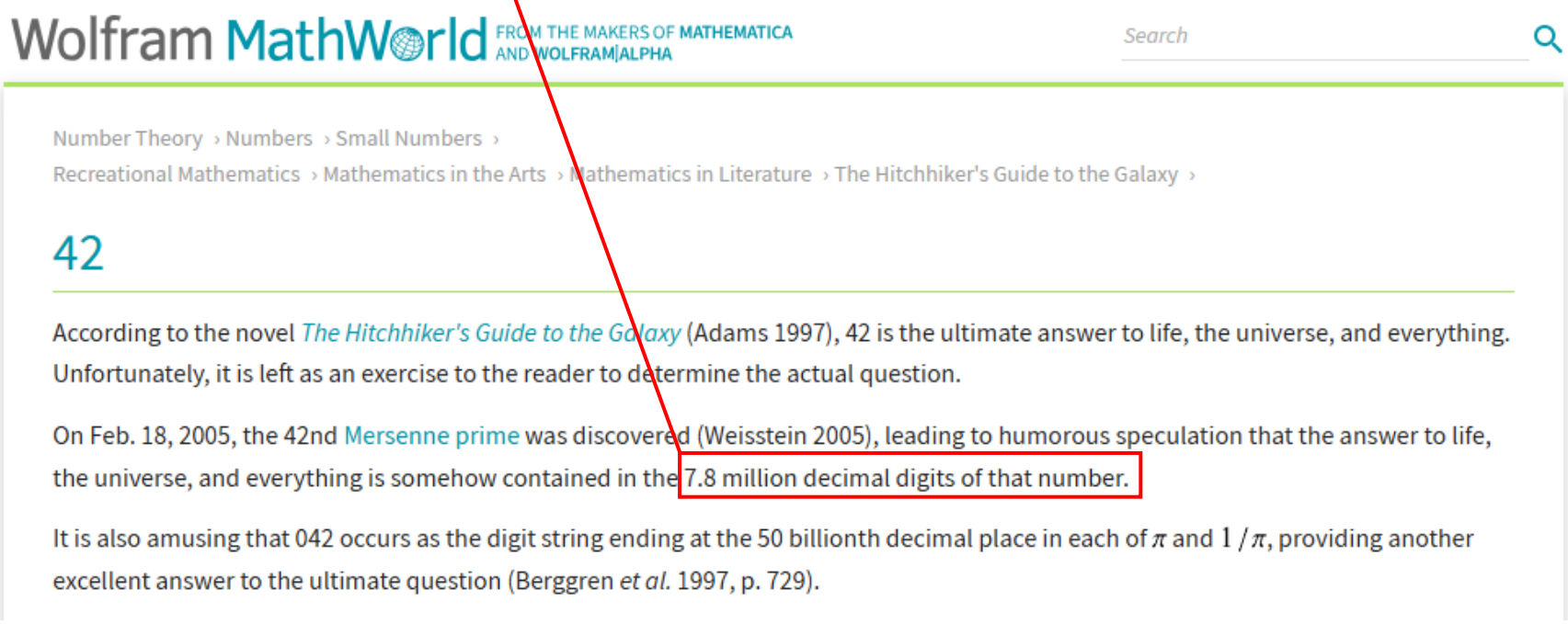
42nd Mersenne prime

Marin Mersenne
(1588-1648)

$$10^x = 2^{25964951}$$

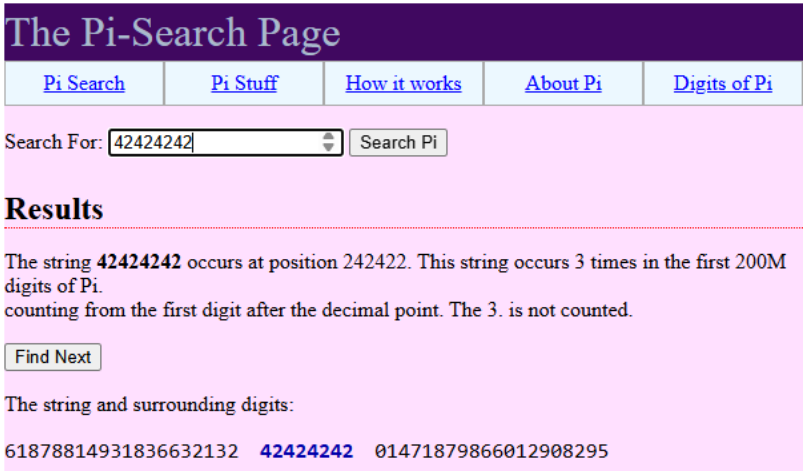
$$\therefore x = 25,964,951 \times \log_{10} 2$$

$$\therefore x \approx 7.82 \times 10^6$$



$$\pi = 3.14159265359\ldots$$

$242,422$ places after the decimal point ...



... is the digit string

42424242

https://www.angio.net/pi/

ASCII 42

*

alt + 42
(Asterisk)

is typically a ‘wildcard’ in computer languages, which means *it could be anything!*

Low Ascii

000:	013:	026: →	039: ’	052: 4	065: A	078: N	091: [	104: h	117: u
001: ☺	014: ♫	027: ←	040: (	053: 5	066: B	079: O	092: \	105: i	118: v
002: ☻	015: ☼	028: ∟	041:)	054: 6	067: C	080: P	093:]	106: j	119: w
003: ♥	016: ►	029: ↔	042: *	055: 7	068: D	081: Q	094: ^	107: k	120: x
004: ♦	017: ◄	030: ▲	043: +	056: 8	069: E	082: R	095: _	108: l	121: y
005: ♣	018: ↕	031: ▼	044: ,	057: 9	070: F	083: S	096: `	109: m	122: z
006: ♠	019: ‼	032:	045: -	058: :	071: G	084: T	097: a	110: n	123: {
007: •	020: ¶	033: !	046: .	059: ;	072: H	085: U	098: b	111: o	124: ¦
008: ◘	021: §	034: "	047: /	060: <	073: I	086: V	099: c	112: p	125: }
009: ○	022: ▬	035: #	048: 0	061: =	074: J	087: W	100: d	113: q	126: ~
010: ◙	023: ↨	036: $	049: 1	062: >	075: K	088: X	101: e	114: r	127: ⌂
011: ♂	024: ↑	037: %	050: 2	063: ?	076: L	089: Y	102: f	115: s	
012: ♀	025: ↓	038: &	051: 3	064: @	077: M	090: Z	103: g	116: t	

High Ascii

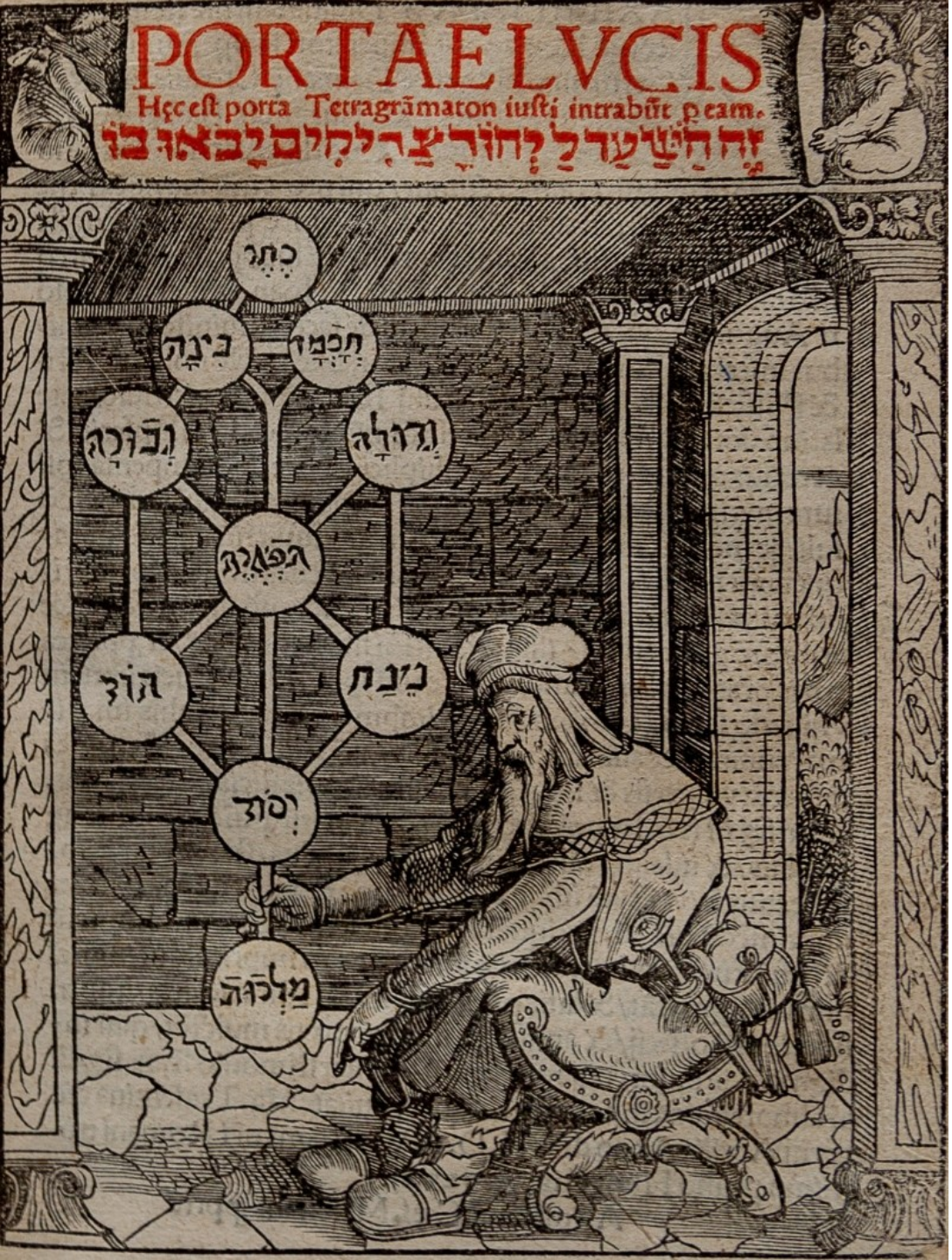
128: Ç	141: ì	154: Ü	167: º	180: ┤	193: ┴	206: ╬	219: █	232: ɸ	245: ⌡
129: ü	142: Ä	155: ¢	168: ¿	181: ╡	194: ┬	207: ╧	220: ▄	233: Θ	246: ÷
130: é	143: Å	156: £	169: ⌐	182: ╢	195: ├	208: ╨	221: ▌	234: Ω	247: ≈
131: â	144: É	157: ¥	170: ¬	183: ╖	196: ─	209: ╤	222: ▐	235: δ	248: °
132: ä	145: æ	158: ₧	171: ½	184: ╕	197: ┼	210: ╥	223: ▀	236: ∞	249: ∙
133: à	146: Æ	159: ƒ	172: ¼	185: ╣	198: ╞	211: ╙	224: α	237: ø	250: ·
134: å	147: ô	160: á	173: ¡	186: ║	199: ╟	212: ╘	225: ß	238: ϵ	251: √
135: ç	148: ö	161: í	174: «	187: ╗	200: ╚	213: ╒	226: Γ	239: ∩	252: ⁿ
136: ê	149: ò	162: ó	175: »	188: ╝	201: ╔	214: ╓	227: π	240: ≡	253: ²
137: ë	150: û	163: ú	176: ░	189: ╜	202: ╩	215: ╫	228: Σ	241: ±	254: ■
138: è	151: ù	164: ñ	177: ▒	190: ╛	203: ╦	216: ╪	229: σ	242: ≥	255:
139: ï	152: ÿ	165: Ñ	178: ▓	191: ┐	204: ╠	217: ┘	230: µ	243: ≤	
140: î	153: Ö	166: ª	179: │	192: └	205: ═	218: ┌	231: τ	244: ⌠	

Babel fish

Before Google Translate was invented!

Torah (Jewish holy book)

Each scroll must have at least 42 lines



42 in **Kabbalah** (mystic sect of Judaism)

42-letter Name of God
Ana beKo'ach

"… unique formula built of **42 letters** written in **seven** sentences of **six words** each. Each of the seven sentences correspond to the **seven days of the week**, **seven specific angels**, and to a **particular heavenly body**. The letters that make up *Ana beKo'ach* are encoded within the first 42 letters of the book of Genesis."

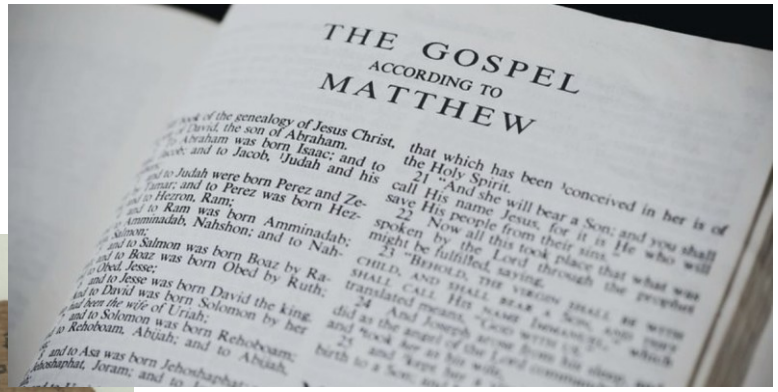
"takes us back to the time of Creation, and each time we meditate on a particular sequence, we return to the original uncorrupted energy that built the world. By performing the *Ana beKo'ach* meditation, we enrich our lives with unadulterated spiritual Light and positive energy."

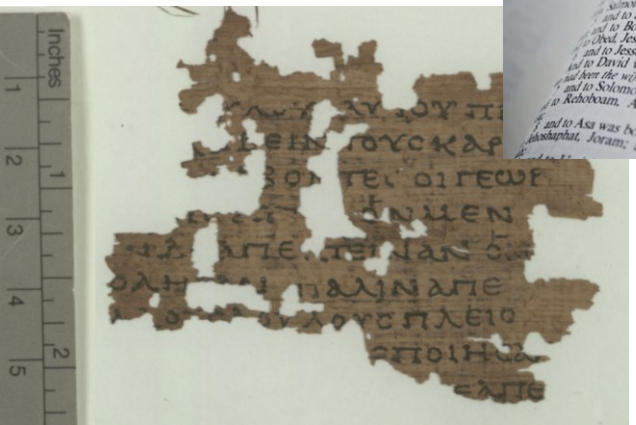
https://onehouse.kabbalah.com/en/articles/the-prayer-of-the-kabbalist/#:~:text=Known%20as%20the%2042%2Dletter,Comments%2014

Abraham

42 generations

First book of New Testament



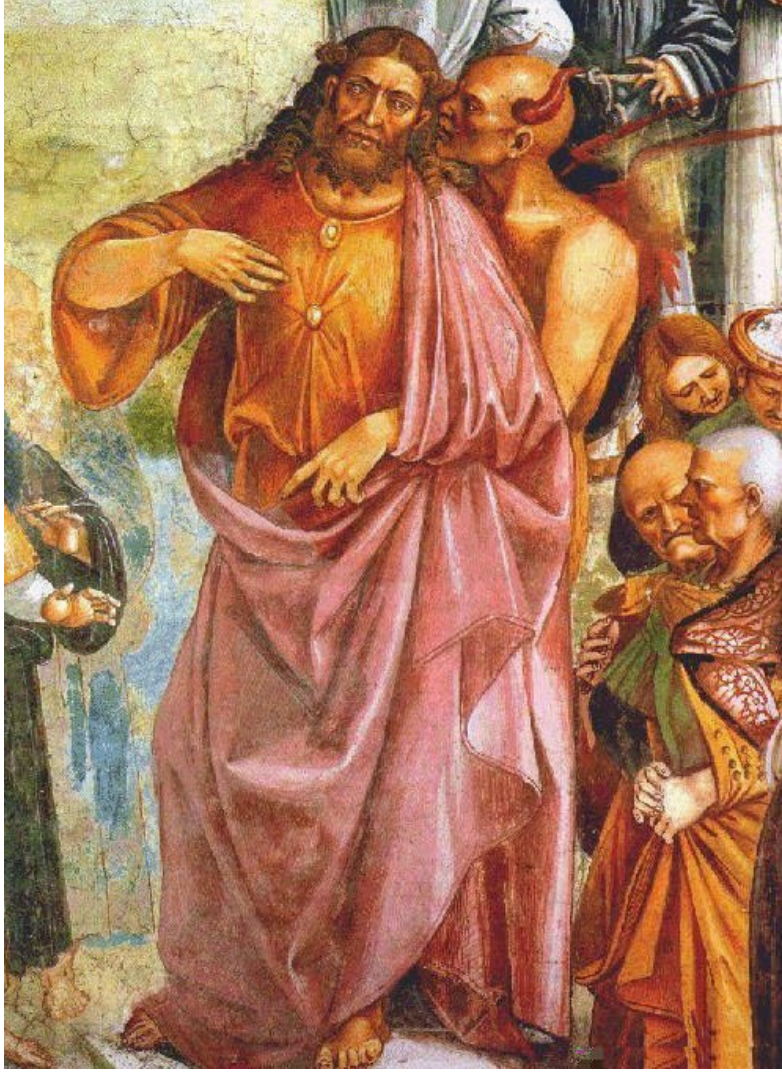


Gospel of Matthew
Papyrus 104 AD 150

Jesus

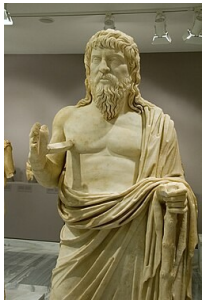
42 is also associated with The Antichrist (i.e. 'false Christ')

Revelation 13:5 says that "**the beast** would continue for 42 months"



The **Neronic persecution of Christians** was instituted in AD 64 and lasted until his death in June AD 68, which is three and a half years, or **42 months.**

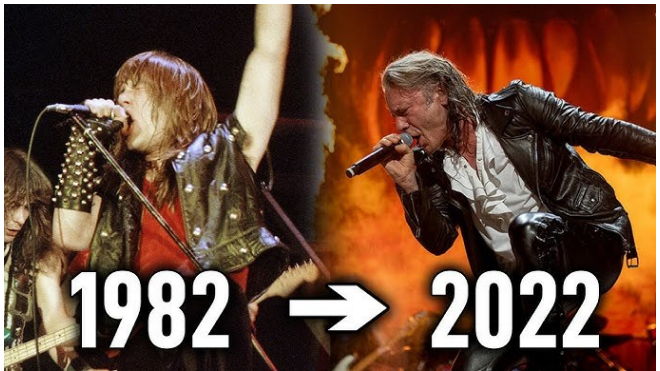
Apollonius of Tyana specifically states that Nero "was called a beast"



Apollonius of Tyana
AD15 to AD 100

Emporer Nero
(Lucius Domitius Ahenobarbus)
AD 37 to AD 68

"Woe to you, oh Earth and Sea, for the devil sends the beast with wrath, because he knows the time is short. Let him you hath understanding reckon the number of the beast for it is a human number, its number is six hundred and sixty six."



More number of the beast facts!

https://mathworld.wolfram.com/BeastNumber.html

A number with **666 digits** is called an **apocalypse number**

I ran out of precision to find the sixth!

$$666^6 \approx 8.726606134562362 \times 10^{16}$$

There are exactly six 6s in the decimal expansion of 666^6

$$666 = 1^6 - 2^6 + 3^6$$

D C L X V I = 666

500
100
50
10
5
1

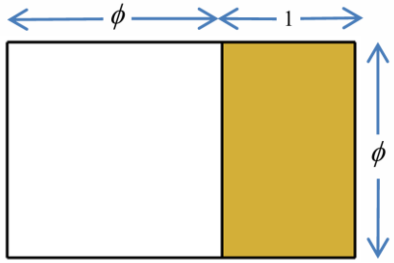
$$666 = 2^2 + 3^2 + 5^2 + 7^2 + 11^2 + 13^2 + 17^2$$

squares of first seven primes

But in geometry, there is beauty in the beast!

https://www.cut-the-knot.org/arithmetic/algebra/BeautyBeast.shtml

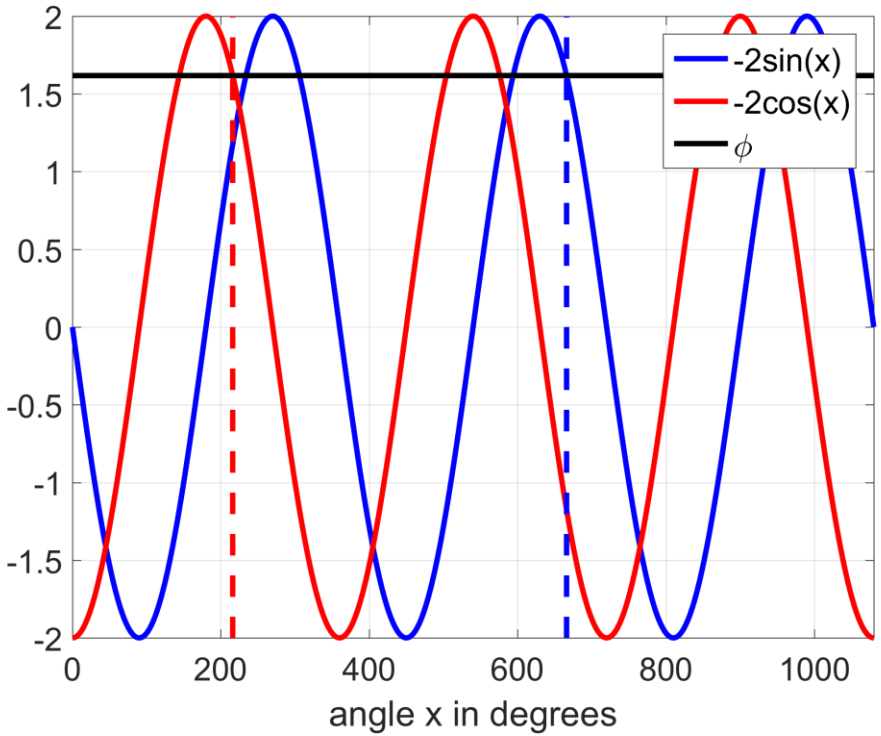
$$\phi = \frac{1+\sqrt{5}}{2}$$



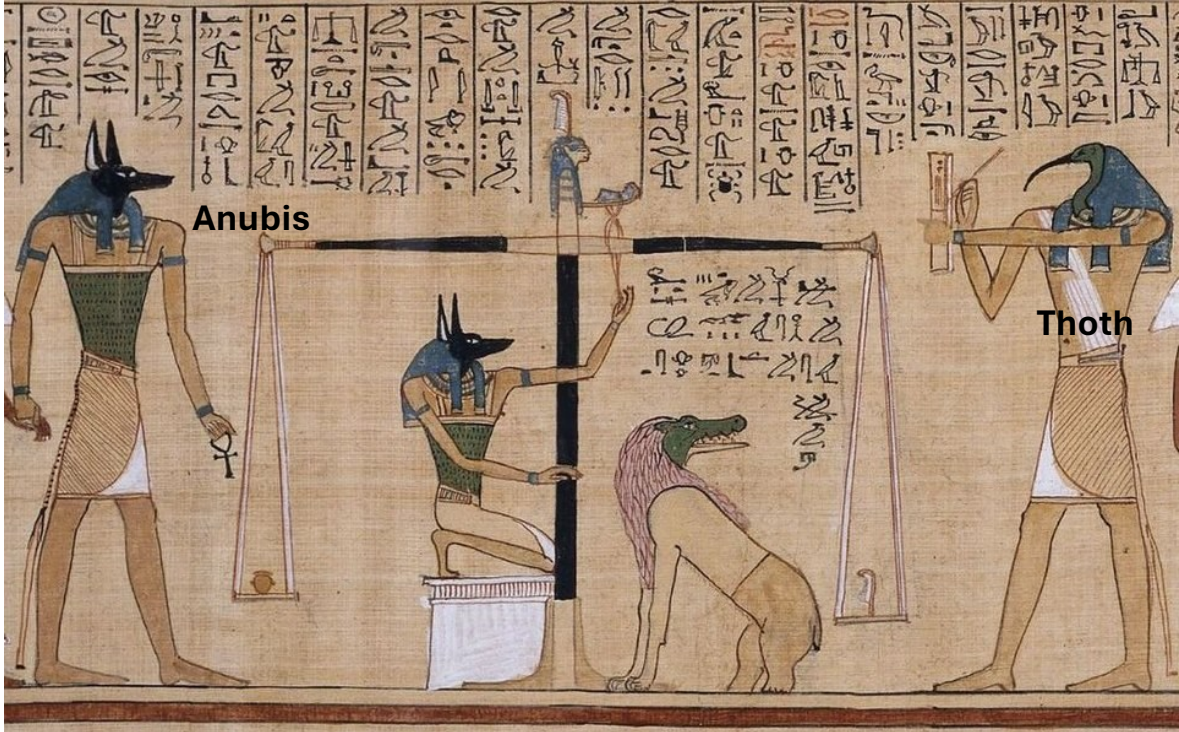
$$= -2\sin\left(666^\circ\right)$$

$$= -2\cos\left(216^\circ\right)$$

$$= -2\cos\left(6\times 6\times 6^\circ\right)$$



The **Assessors of Maat** were **42** minor ancient Egyptian *deities of the Maat* charged with judging the souls of the dead in the afterlife by joining the judgment of Osiris in the *Weighing of the Heart*.



Book of the Dead
by scribe Hunefer
(1300 BC)

42

4 四 shi

2 二 ni

shini = 死 DEATH

is considered unlucky in Japanese culture

Shichi (seven) is lucky
but shichi-squared is not!

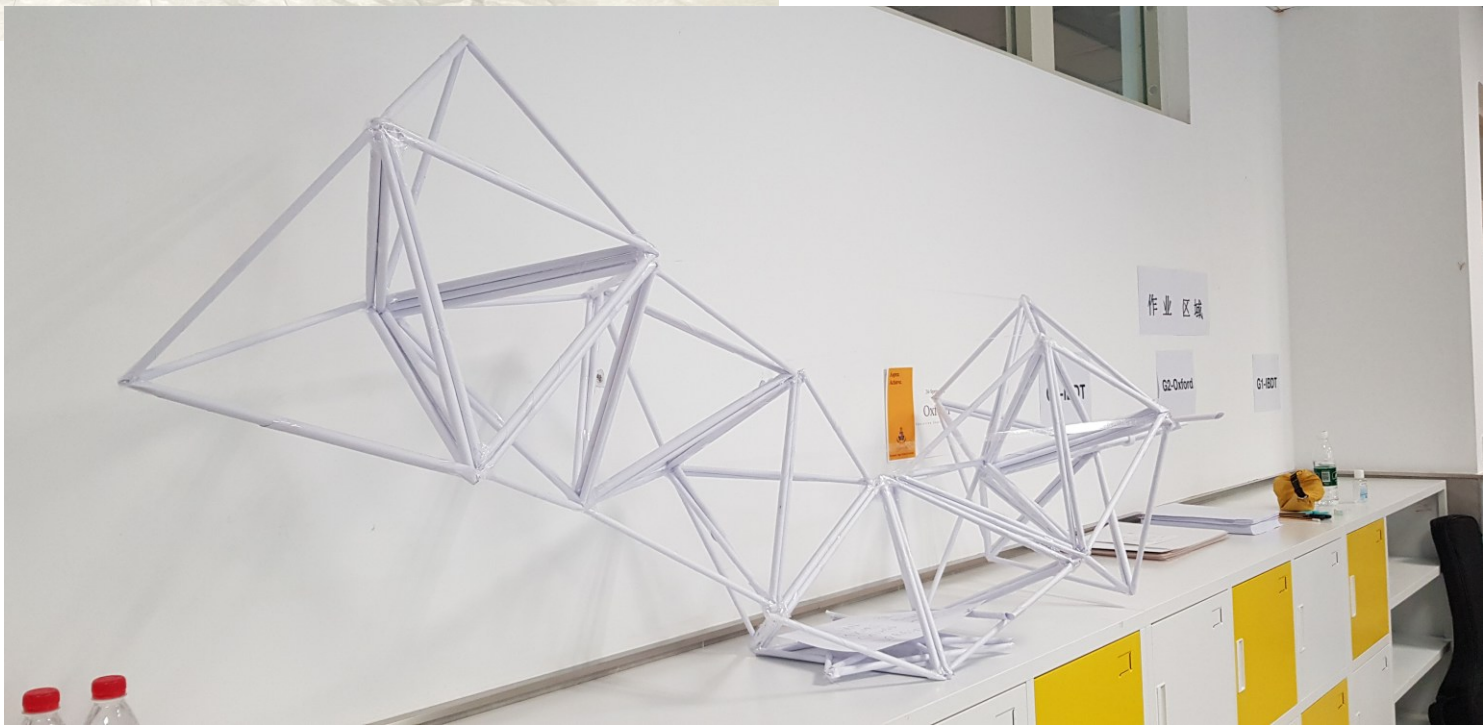
49 similar to *shiku*
“to suffer and die”

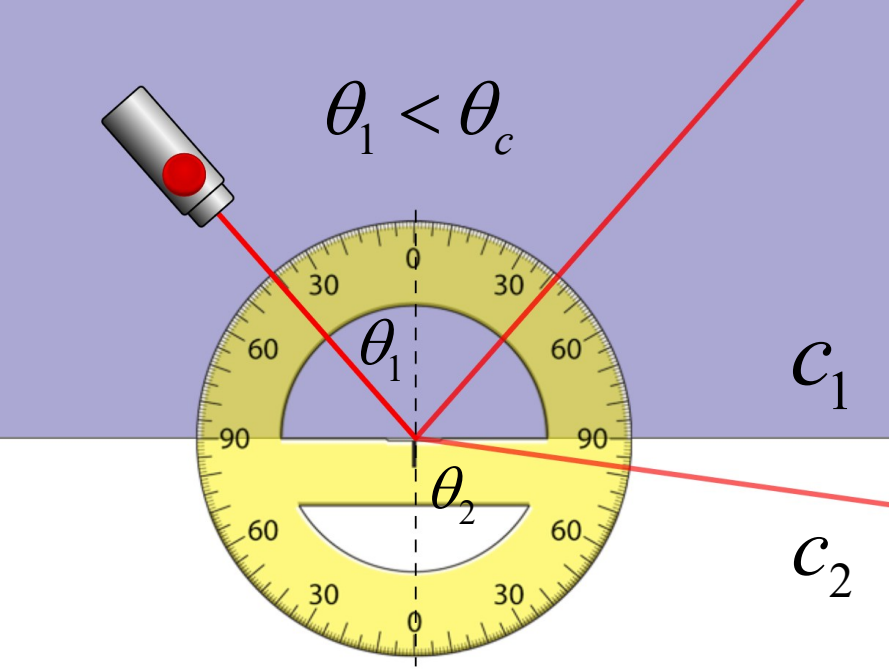
殺 KILL 岩 ROCK
音 SOUND 秘密 SECRET
悪 EVIL 暁 DAYBREAK
死 DEATH 金属 METAL
黒 BLACK 達人 MASTER

Dishy Designs

Tetraphobia!

I hope the *BPhO 2025 Dragon* (made of paper tetrahedrons) wasn't a faux pas!





Speed of light in:

Air $c_2 = 3\times10^8 \text{ ms}^{-1}$

Glass $c_1 = 2\times10^8 \text{ ms}^{-1}$

Critical angle for *refraction* at a glass-air interface

$$\theta_c = \sin^{-1}\left(\frac{2}{3}\right) \approx 42^\circ$$

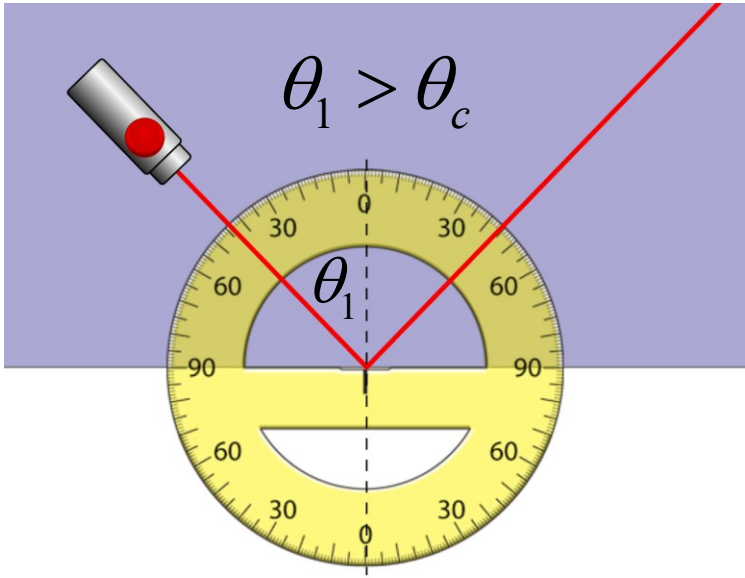
Snell's Law

$$\frac{\sin\theta_1}{c_1} = \frac{\sin\theta_2}{c_2}$$

Critical angle if $\theta_2 = 90^\circ$ $\quad c_2 > c_1$

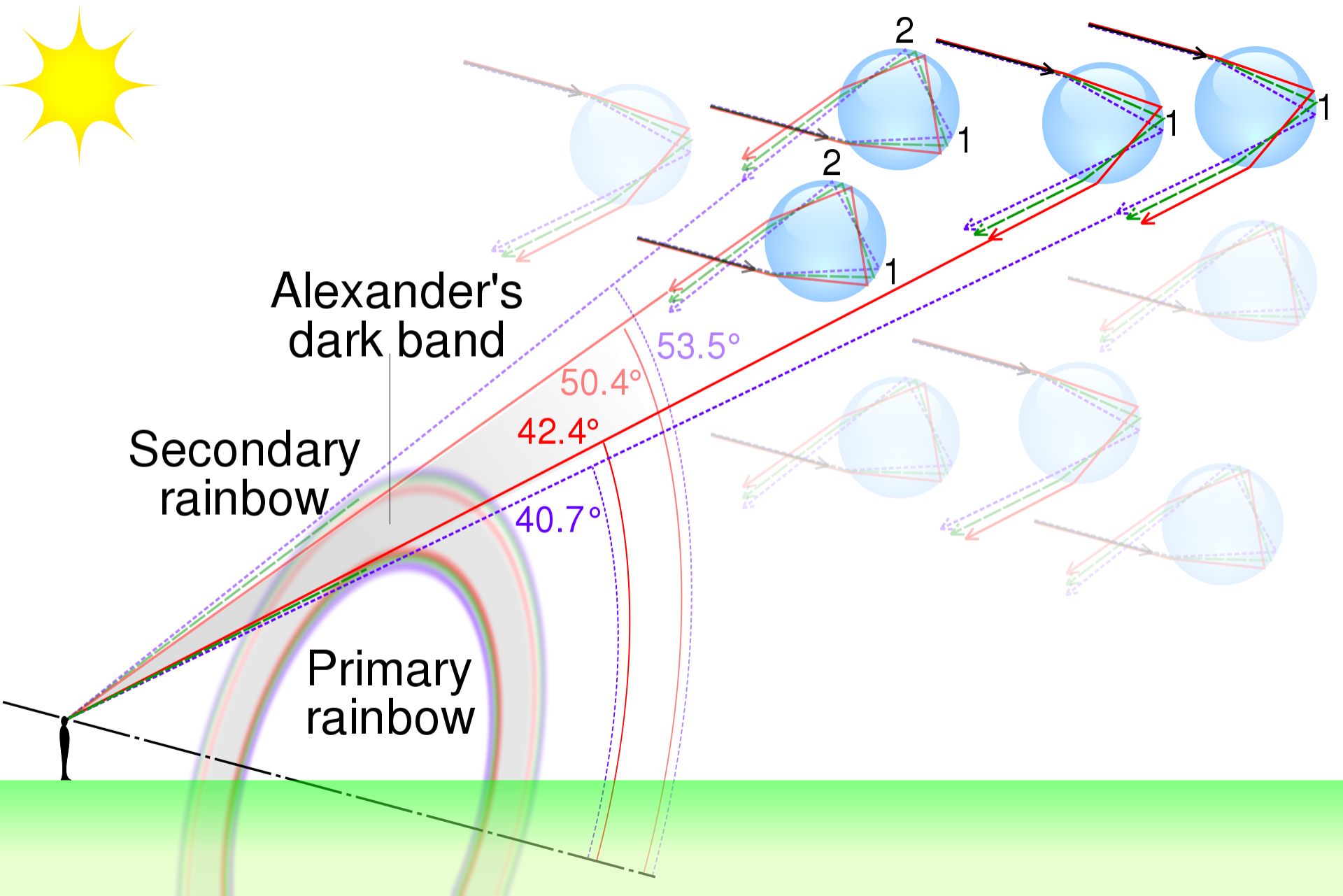
$$\theta_1 = \theta_c = \sin^{-1}\left(\frac{c_1}{c_2}\right)$$

Willebrord Snellius (1580-1626)



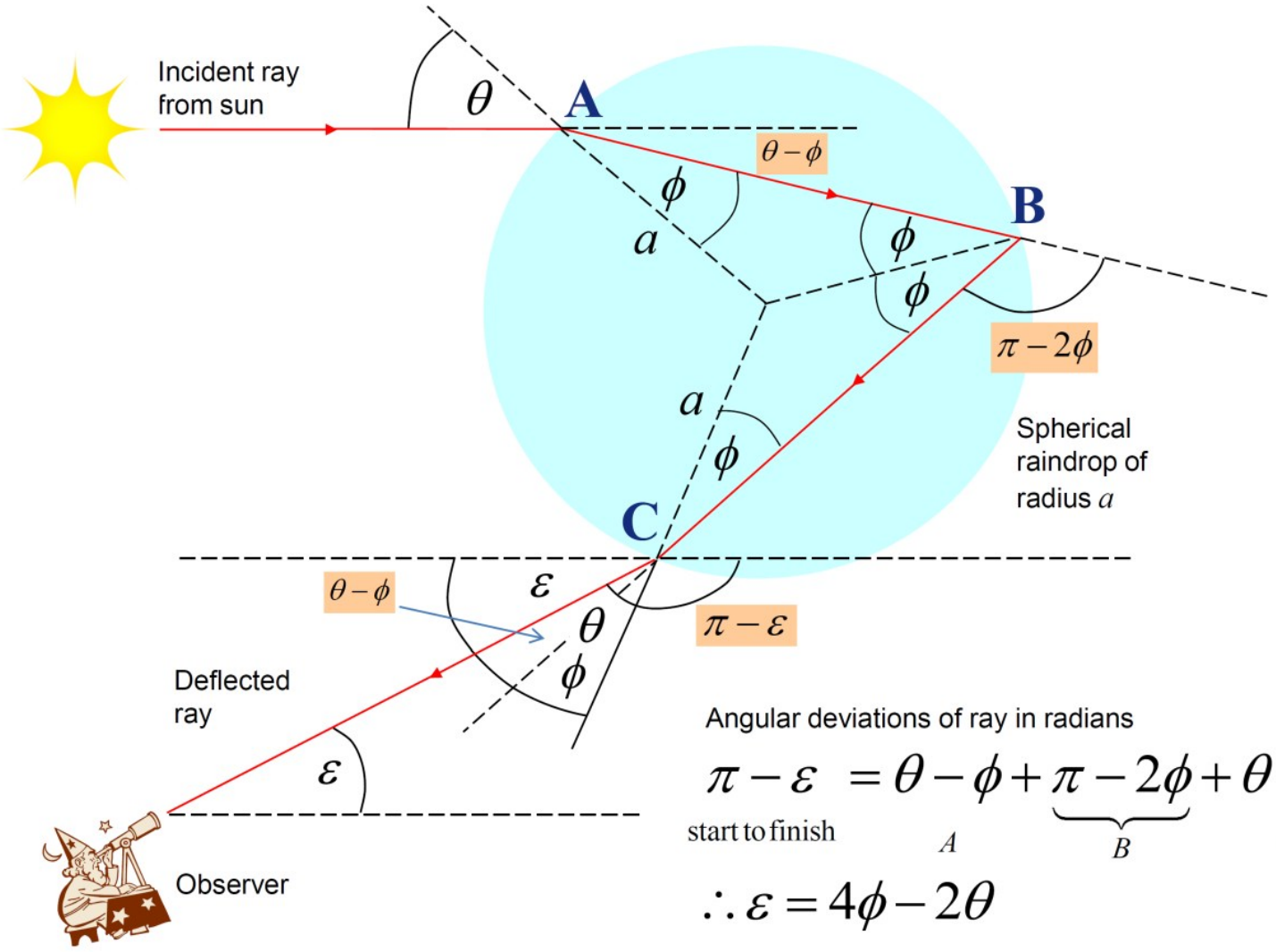
Elevation of a primary rainbow from the *anti-solar* direction is about 42°

https://en.wikipedia.org/wiki/Rainbow



Descartes theory of the rainbow

'des cartes postal'!

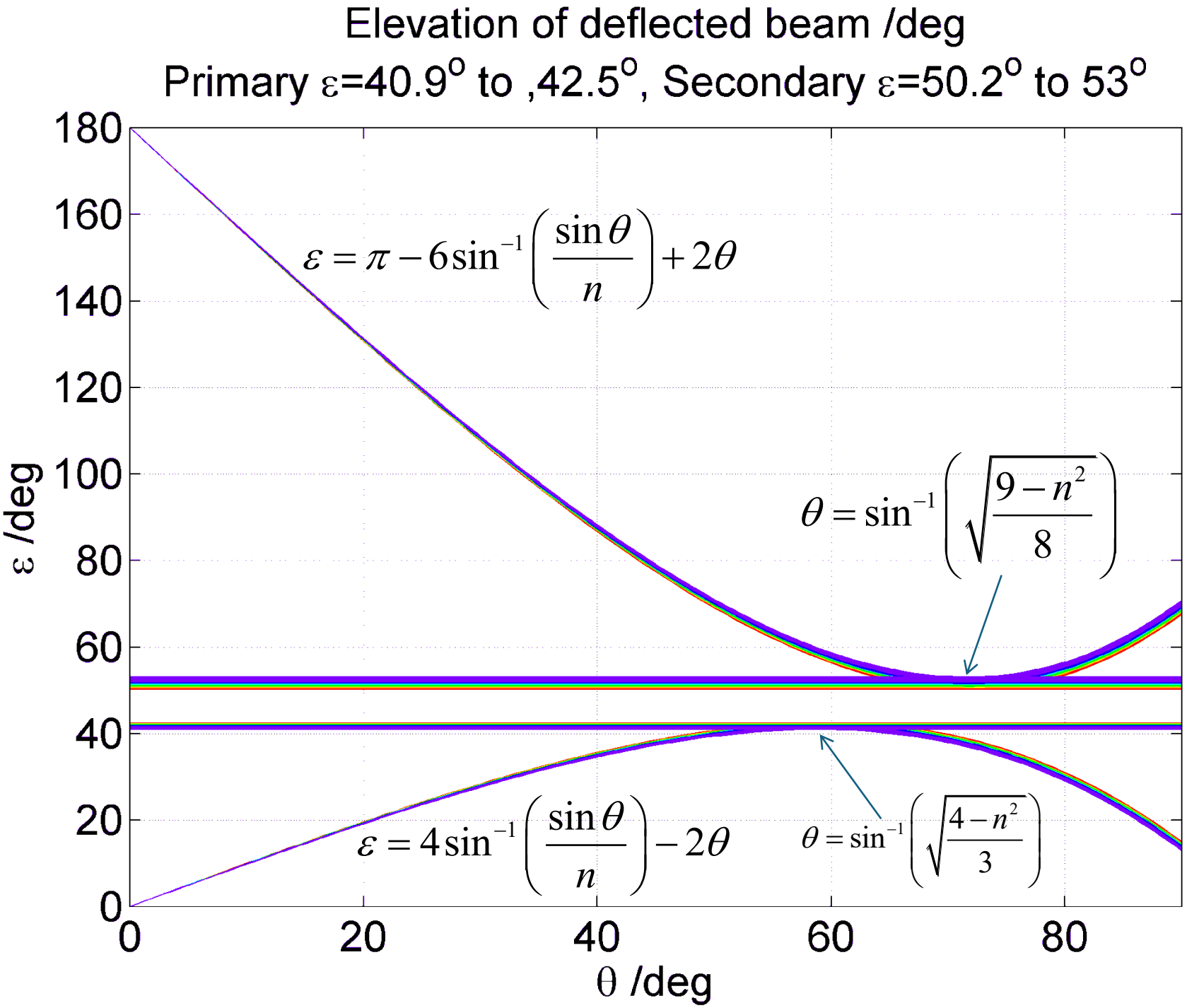


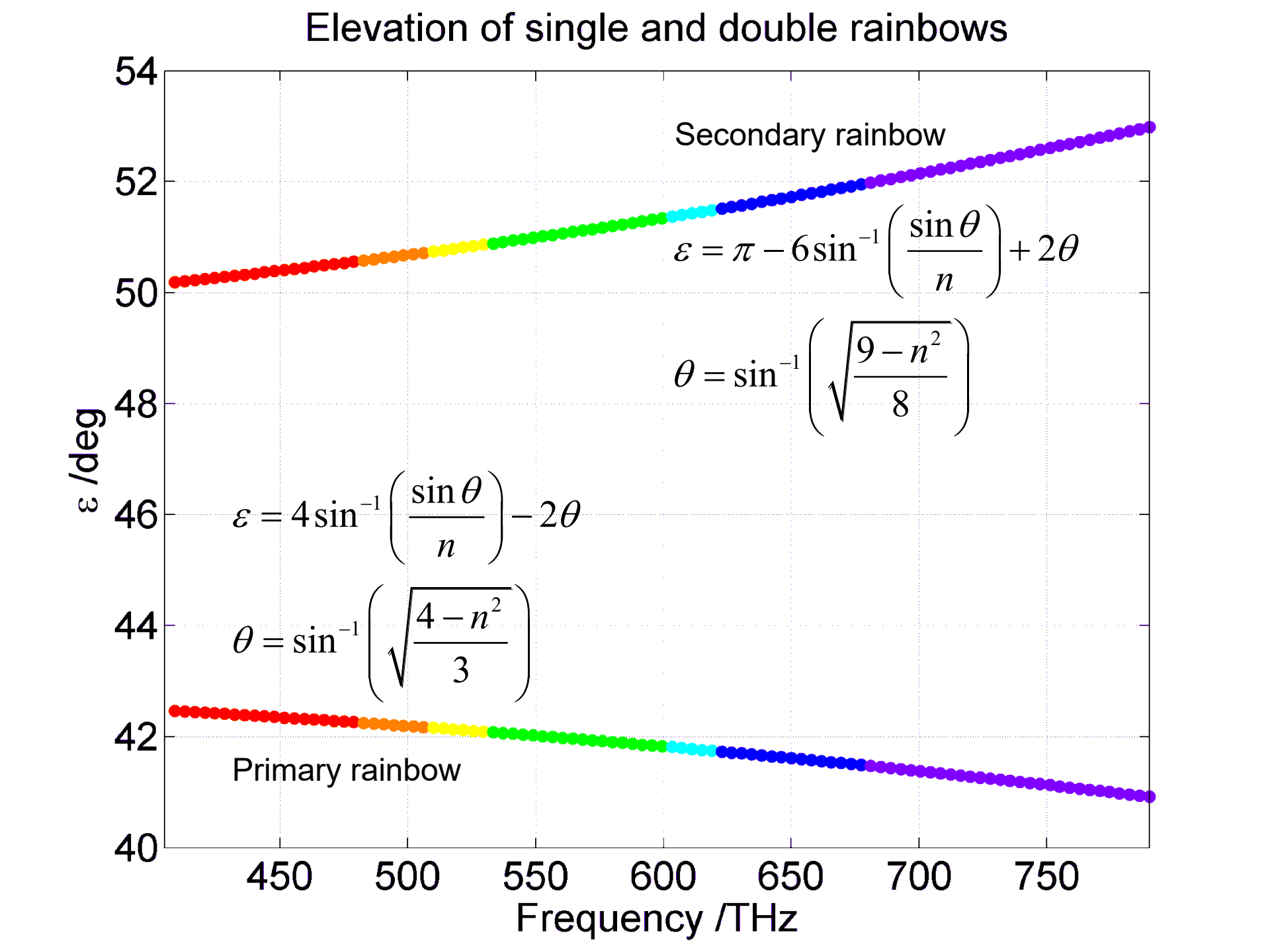
Angular deviations of ray in radians

$$\pi - \varepsilon = \theta - \phi + \underbrace{\pi - 2\phi}_{B} + \theta - \phi$$

start to finish A C

$$\therefore \varepsilon = 4\phi - 2\theta$$


Elevation of deflected beam /deg
Primary ε=40.9° to ,42.5°, Secondary ε=50.2° to 53°
ε /deg
θ /deg
0
20
40
60
80
100
120
140
160
180
$\varepsilon = \pi - 6\sin^{-1}\left(\frac{\sin\theta}{n}\right) + 2\theta$
$\theta = \sin^{-1}\left(\sqrt{\frac{9-n^2}{8}}\right)$
$\varepsilon = 4\sin^{-1}\left(\frac{\sin\theta}{n}\right) - 2\theta$
$\theta = \sin^{-1}\left(\sqrt{\frac{4-n^2}{3}}\right)$


Elevation of single and double rainbows
Secondary rainbow
$\varepsilon = \pi - 6\sin^{-1}\left(\frac{\sin\theta}{n}\right) + 2\theta$
$\theta = \sin^{-1}\left(\sqrt{\frac{9-n^2}{8}}\right)$
$\varepsilon = 4\sin^{-1}\left(\frac{\sin\theta}{n}\right) - 2\theta$
$\theta = \sin^{-1}\left(\sqrt{\frac{4-n^2}{3}}\right)$
Primary rainbow
ε /deg
Frequency /THz
54
52
50
48
46
44
42
40
450
500
550
600
650
700
750

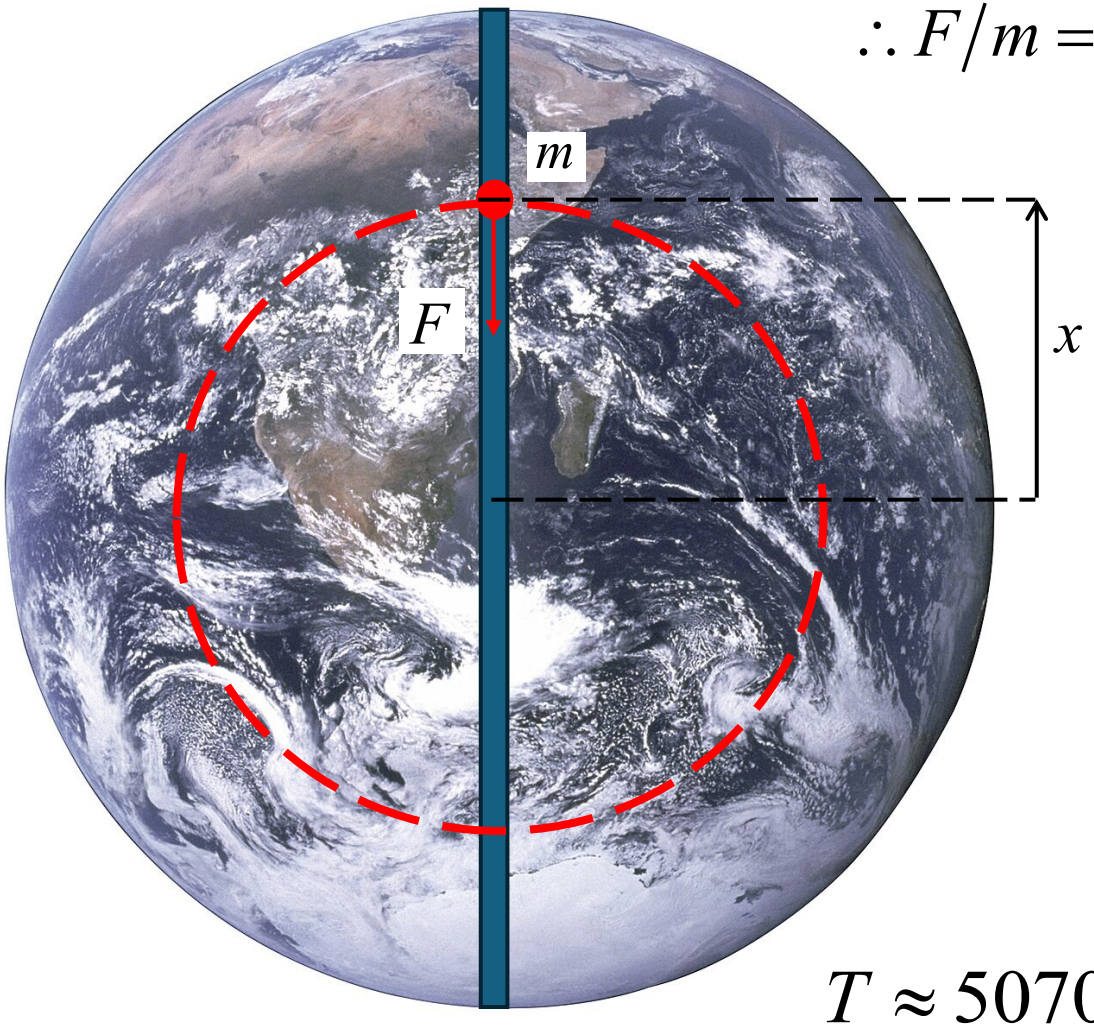
$G = 6.67 \times 10^{-11}\ \mathrm{m^3 kg^{-1} s^{-2}}$

$$F = \frac{GMm}{x^2}, \quad M = \tfrac{4}{3}\pi x^3 \rho$$

$$\therefore F/m = \tfrac{4}{3}\pi G \rho x$$

Isaac Newton
(1643-1727)

Newton II



$$\frac{d^2x}{dt^2} = -\tfrac{4}{3}\pi G \rho x$$

$$x = R\cos\left(2\pi \frac{t}{T}\right), \qquad \frac{d^2x}{dt^2} = -\frac{4\pi^2}{T^2}x$$

$$\Rightarrow \tfrac{4}{3}\pi G\rho = \frac{4\pi^2}{T^2}$$

$$\Rightarrow \boxed{T = \sqrt{\frac{3\pi}{G\rho}}}$$

$$T \approx 5070\,\mathrm{s} \approx 2 \times \boxed{42\,\mathrm{mins}}$$

Earth mass $M = 5.972 \times 10^{24}\ \mathrm{kg}$

Earth radius $R = 6.378 \times 10^{6}\ \mathrm{m}$

$$\rho = \frac{M}{\frac{4}{3}\pi R^3} \approx 5,495\,\mathrm{kgm^{-3}}$$

A4 paper thickness is about 0.1mm

If you could fold A4 paper 42 times ....

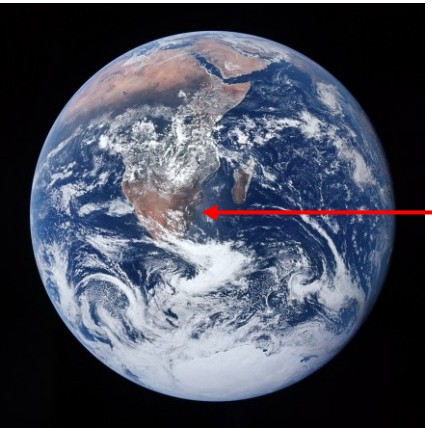
... the thickness would be: $x = 2^{42} \times 0.1 \times 10^{-3}\ \text{m}$

$$\boxed{x = 4.40 \times 10^{8}\ \text{m}}$$

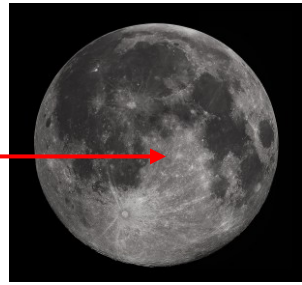
The Earth moon (average) separation is about: $3.85 \times 10^{8}\ \text{m}$

So 42 folds of A4 paper would exceed the Earth-moon separation by 14%

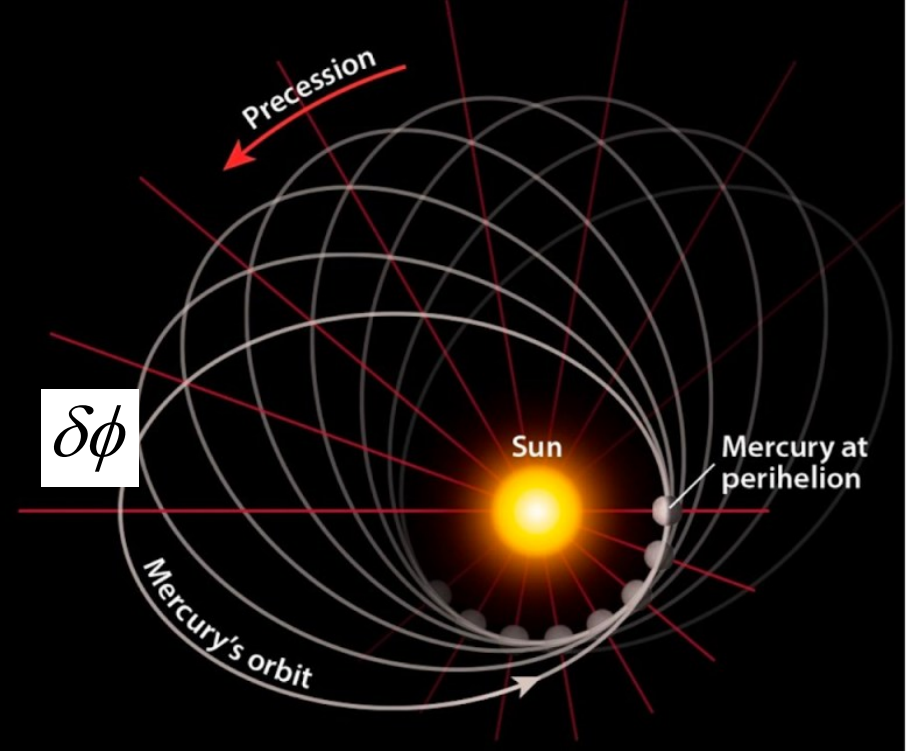
(If we took the A4 paper thickness to be 0.088mm then 42 folds would equal the distance)

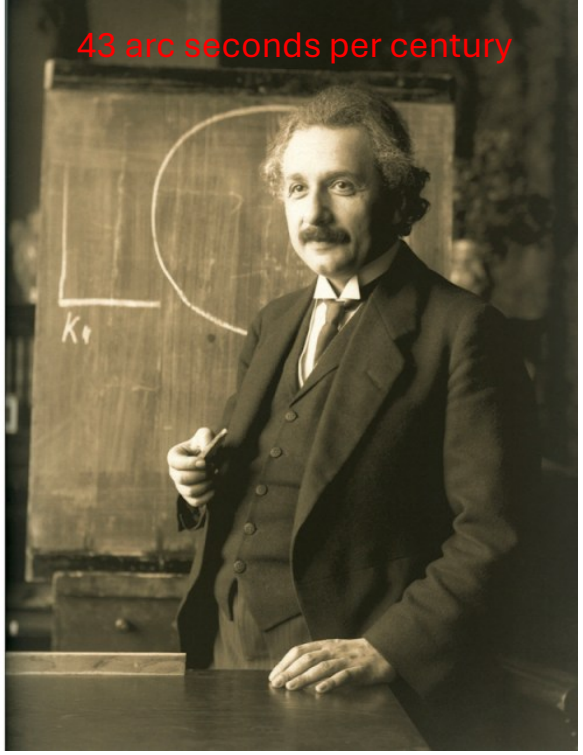


$$r_{\oplus m} \approx 60 R_{\oplus} \approx 385{,}400 \times 10^{3}\ \text{m}$$



Not to scale!

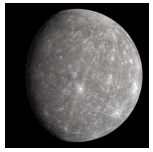




Albert Einstein (1879-1955)

Mercury ☿

Not quite 42...



Sources of the precession of perihelion for Mercury

Amount (arcsec/Julian century)[12]	Cause
532.3035	gravitational tugs of other solar bodies
0.0286	oblateness of the Sun (quadrupole moment)
42.9799	gravitoelectric effects (Schwarzschild-like), a general relativity effect
−0.0020	Lense–Thirring precession
575.31[12]	total predicted
574.10 ± 0.65[11]	observed

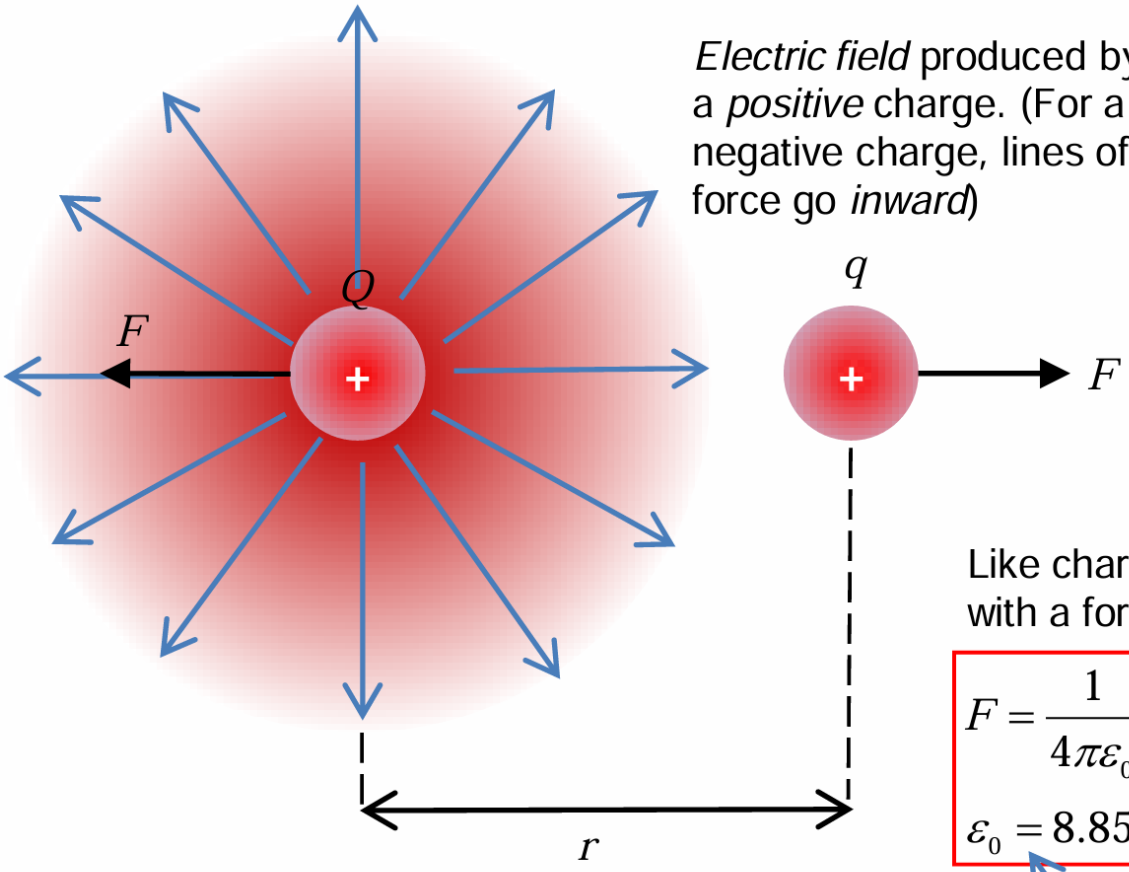
https://en.wikipedia.org/wiki/Tests_of_general_relativity

$$\delta\phi \approx \frac{24\pi^3 a^2}{T^2 c^2 (1-e^2)}$$

$$a = 0.387\,\mathrm{AU}$$

$$e = 0.206$$

$$T = 0.241\,\mathrm{Yr}$$



Electric field produced by a *positive* charge. (For a negative charge, lines of force go *inward*)

$$e = 1.602 \times 10^{-19}\ \text{C}$$

Like charges will *repel* with a force

$$F = \frac{1}{4\pi\varepsilon_0}\frac{qQ}{r^2}$$

This is Coulomb's Law of Electrostatics

$$\varepsilon_0 = 8.8542 \times 10^{-12}\ \text{Fm}^{-1}$$

Permittivity of free space

$$F_E = \frac{e^2}{4\pi\varepsilon_0 r^2}$$ Electrostatic repulsion

$$F_G = \frac{Gm_e^2}{r^2}$$ Gravitational attraction

$$G = 6.67 \times 10^{-11}\ \text{m}^3\text{kg}^{-1}\text{s}^{-2}$$

$$m_e = 9.109 \times 10^{-31}\ \text{kg}$$

Ratio of electric to gravitational forces between two electrons

$$\frac{F_E}{F_G} = \frac{e^2}{4\pi\varepsilon_0 G m_e^2} \approx 4.2 \times 10^{42}$$

Hat Creek Observatory, California

https://www.seti.org/projects/ata/

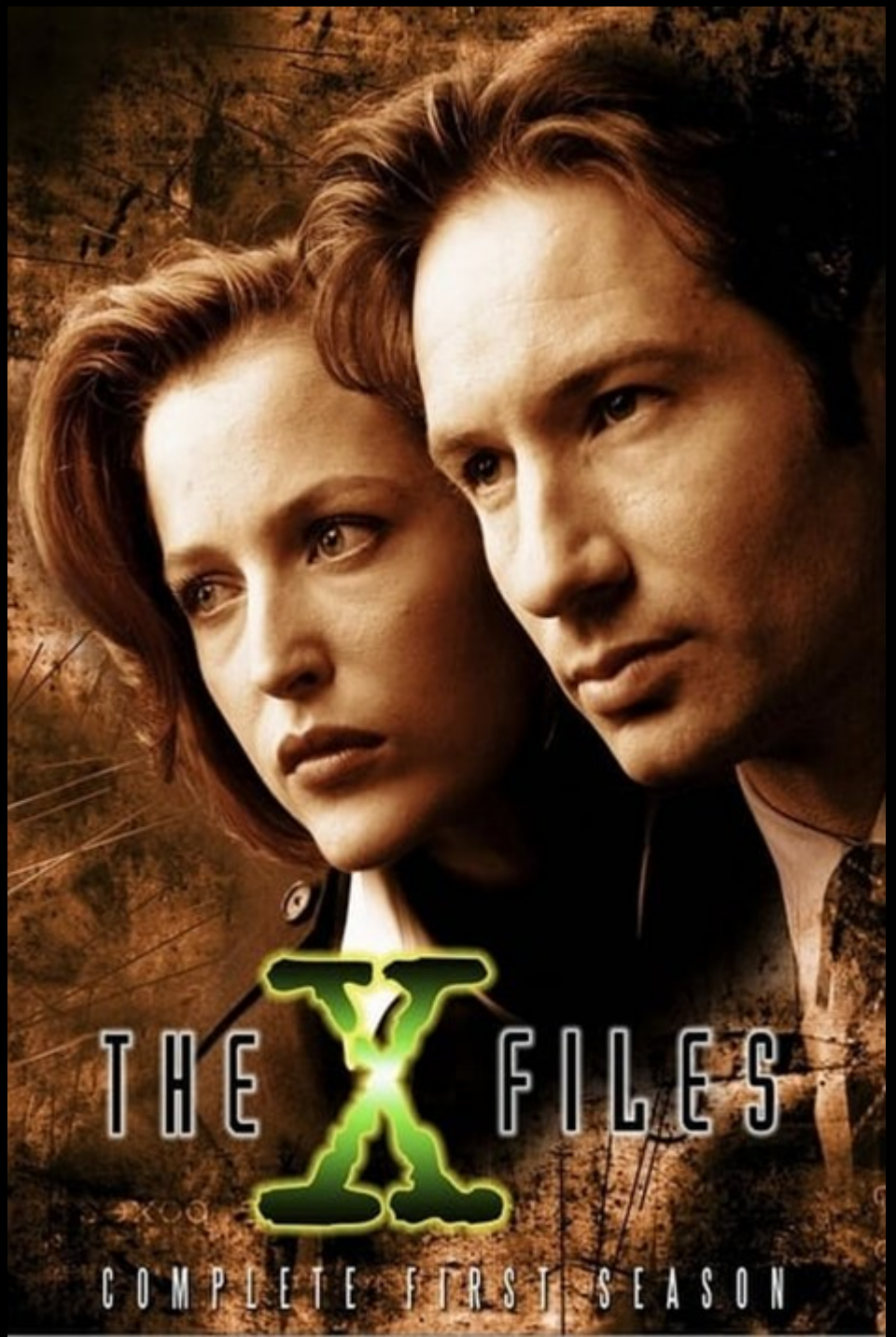
SETI (Search for Extraterrestrial Life)
42 antennas, each 6m diameter

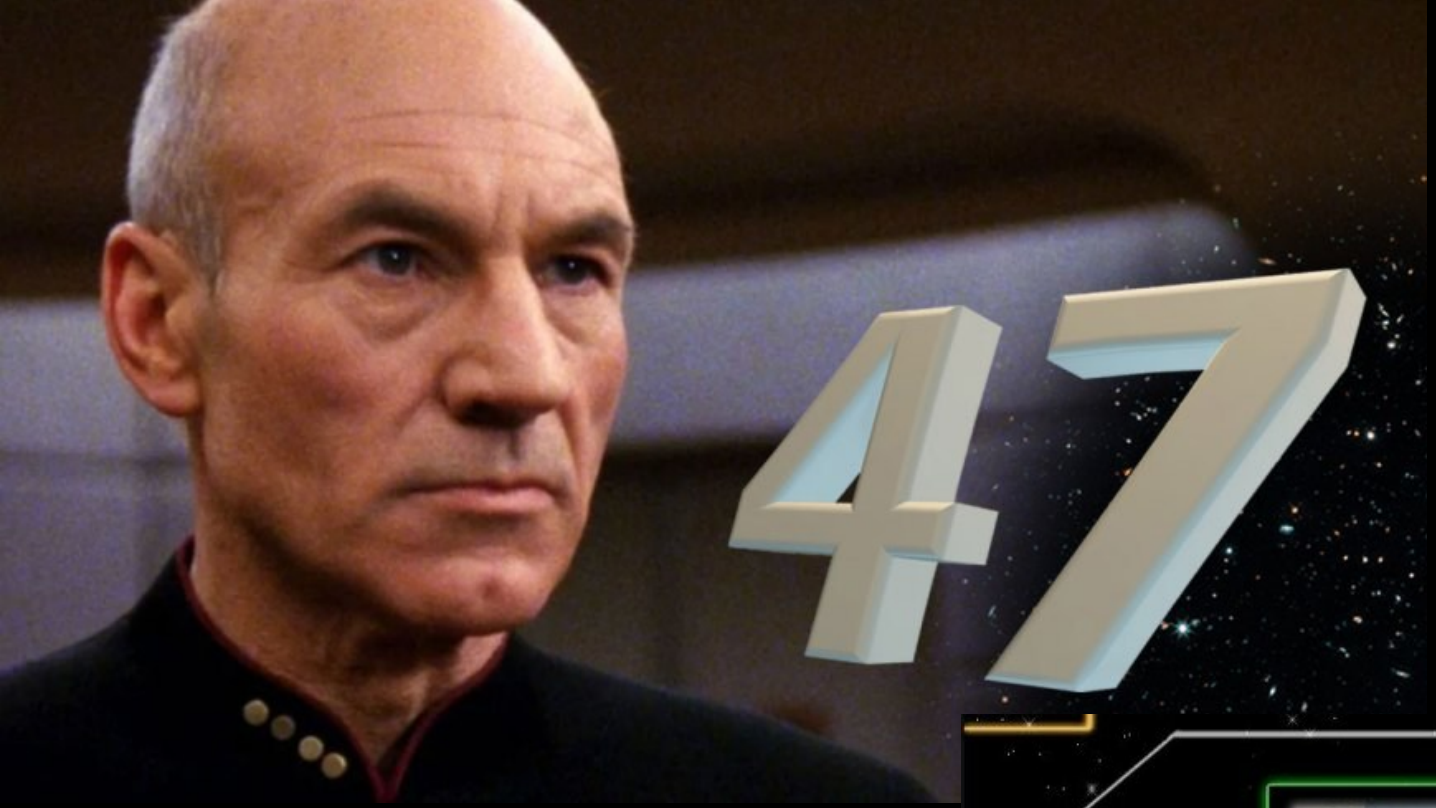

4
2

ALCHEMAX
42

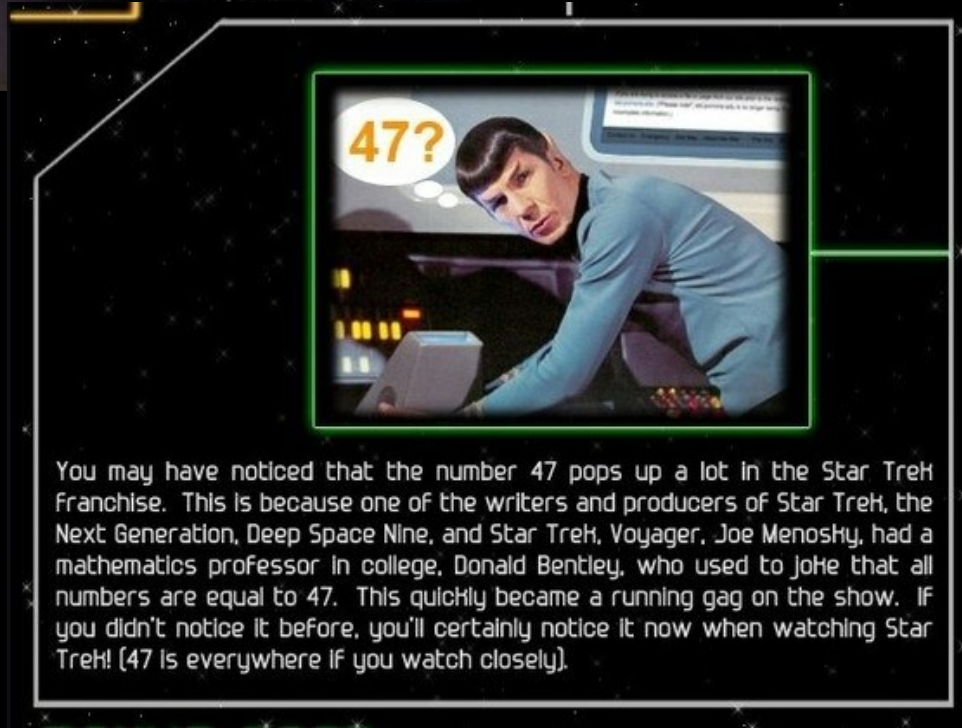
MARVEL
SPIDER-MAN
MILES MORALES

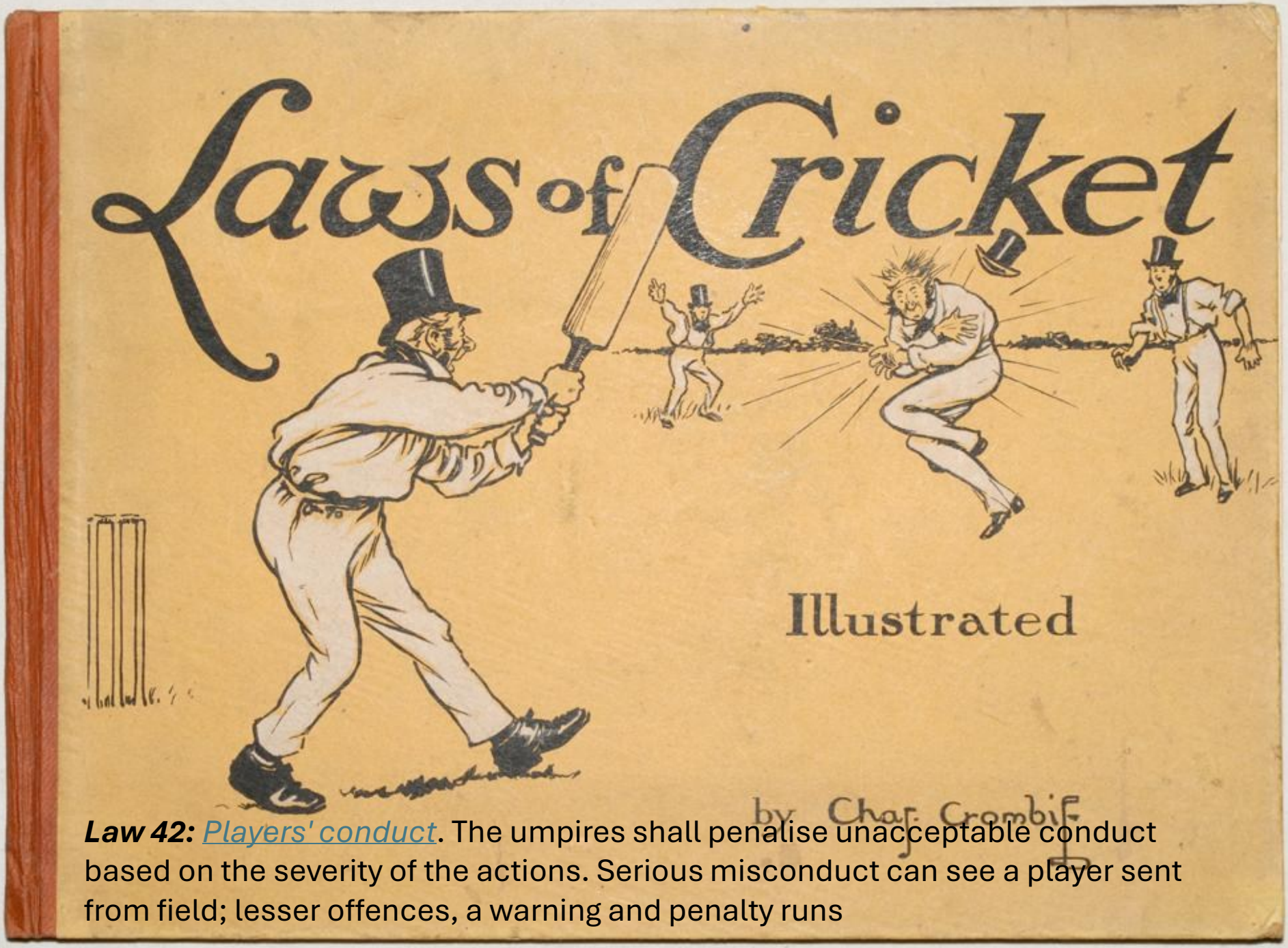

42


THE X FILES
COMPLETE FIRST SEASON



“42 adjusted for inflation”



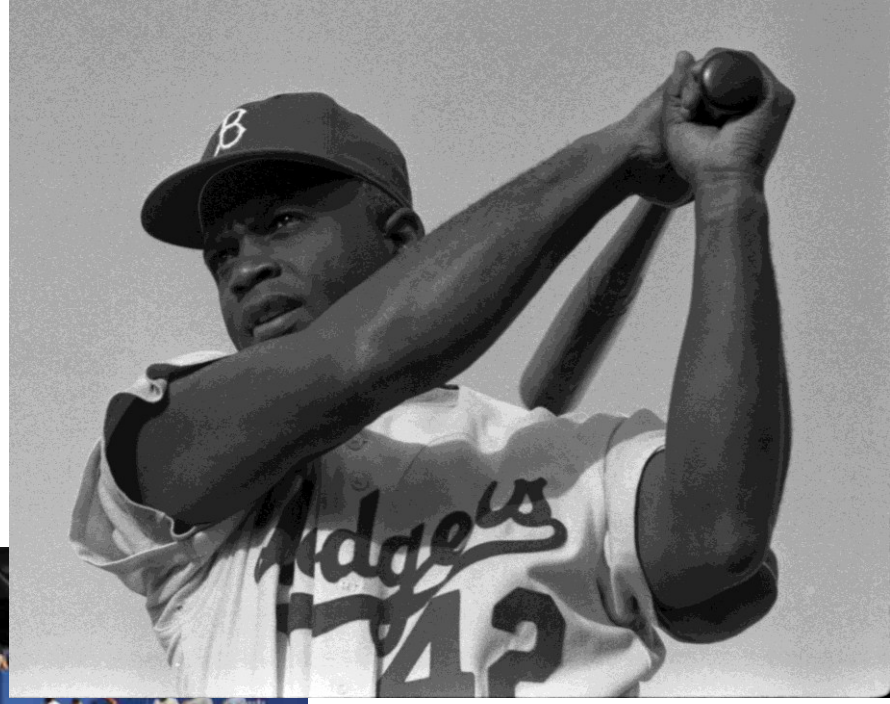


Law 42: *Players' conduct*. The umpires shall penalise unacceptable conduct based on the severity of the actions. Serious misconduct can see a player sent from field; lesser offences, a warning and penalty runs

Jackie Robinson day

15th April

The shirt number 42 is not used by *any* players, apart from on April 15th, when ALL players wear 42.



Jackie Robinson (1919-1972)

First black major league baseball player (from 1947). This ended eighty years of racial segregation in baseball.