π *rational*

Thomas Guyer

abstract

we define π , e , $Li_s(z)$ rational,

proof the riemann hypothesis,

and create a polynom and formula for π

π *rational*

Leibniz:	$\frac{1}{1} - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \ldots$	$= \frac{\pi}{4}$
Guyer:	$\frac{1}{1}, \frac{2}{3}, \frac{13}{15}, \frac{76}{105}, \frac{789}{945}, \ldots$	$= \frac{\pi}{4}$

"a sum up	gives a rational expression"				
$\frac{1}{1}$	$= \frac{1}{1}$	1 * 3	–	1 * 1	= 2
$- \frac{1}{3}$	$= \frac{2}{3}$	2 * 5	+	1 * 3	= 13
$+ \frac{1}{5}$	$= \frac{13}{15}$	13 * 7	–	1 * 15	= 76
$- \frac{1}{7}$	$= \frac{76}{105}$	76 * 9	+	1 * 105	= 789
$+ \frac{1}{9}$	$= \frac{789}{945}$	…			
…					

or step-by-step

example		$\ldots + \frac{1}{9}$		
divisor	*!fac*	1*3*5*7*9		= 945
dividend	*!guyer !fac*	945 / 1 = 945	* 1	
		945 / 3 = 315	* 1	
		945 / 5 = 189	* 1	
		945 / 7 = 135	* 1	
		945 / 9 = 105	* 1	
		945 – 315 + 189 – 135 + 105		= 789

e***uler rational***

$$e = \sum_{n=0}^{\infty} \frac{1}{n!} = 1 + \frac{1}{1} + \frac{1}{1 \cdot 2} + \frac{1}{1 \cdot 2 \cdot 3} + \cdots$$

$$e = 2{,}71828\ 18284\ 59045\ 23536\ 02874\ 71352\ 66249\ 77572\ 47093\ 69995\ \ldots$$

Guyer: $\frac{1}{1}, \frac{2}{1}, \frac{5}{2}, \frac{32}{12}, \frac{780}{288}, \frac{93888}{34560}, \ldots$

“a sum up	gives a rational expression”				
1	= 1	1 * 1	+	1 * 1	= 2
$+\frac{1}{1}$	$=\frac{2}{1}$	2 * 2	+	1 * 1	= 5
$+\frac{1}{2}$	$=\frac{5}{2}$	5 * 6	+	1 * 2	= 32
$+\frac{1}{6}$	$=\frac{32}{12}$	32 * 24	+	1 * 12	= 780
$+\frac{1}{24}$	$=\frac{780}{288}$	780 * 120	+	1 * 288	= 93888
$+\frac{1}{120}$	$=\frac{93888}{34560}$	…			
…					

or step-by-step

example		… + $\frac{1}{120}$		
divisor	*!fac*	1*2*6*24*120		= 34560
dividend	*!guyer !fac*	34560 / 1 = 34560	* 1	
		34560 / 1 = 34560	* 1	
		34560 / 2 = 17280	* 1	
		34560 / 6 = 5760	* 1	
		34560 / 24 = 1440	* 1	
		34560 / 120 = 288	* 1	
		34560 + 34560 +17280 + 5760 + 1440 + 288		= 93888

$Li_s(z)$ rational

example $Li_5(3)$

"a sum up gives a rational expression"

3	= 3	$3 * 2^5$	$+ 3^2 * 1$	= 105
$+ 3^2 / 2^5$	$= 105 / 2^5$	$105 * 3^5$	$+ 3^3 * 2^5$	= 26379
$+ 3^3 / 3^5$	$= 26379 / 6^5$	$26379 * 4^5$	$+ 3^4 * 6^5$	= 27641952
$+ 3^4 / 4^5$	$= 27641952 / 24^5$	…		
$+ 3^5 / 5^5$				
…				

or step-by-step

example		$… + 3^4 / 4^5$		
ivisor	*!fac*	$1^5 * 2^5 * 3^5 * 4^5$		$= 24^5$
dividend	*!guyer !fac*	$7962624 / 1^5 = 7962624$	$* 3$	
		$7962624 / 2^5 = 248832$	$* 3^2$	
		$7962624 / 3^5 = 32768$	$* 3^3$	
		$7962624 / 4^5 = 7776$	$* 3^4$	
		23887872 + 2239488 + 884736 + 629856		= 27641952

… Euler for $Li_2(1)$ = $\zeta(2)$

„Weil nach Setzen von x = 2 gilt

$$1+\frac{1}{4}+\frac{1}{9}+\frac{1}{16}+\frac{1}{25}+\text{etc} \qquad =\frac{\pi^2}{6} \quad ,$$

wobei π die Peripherie des Kreises bezeichnet, dessen Durchmesser 1 ist, wird sein

$$\frac{4}{3}*\frac{9}{8}*\frac{25}{24}*\frac{49}{48}*\frac{121}{120}*\text{etc} \qquad =\frac{\pi^2}{6} \quad .“$$

with wahrheitstabelle for $\zeta(2)$

$$\frac{1}{1},\frac{5}{4},\frac{49}{36},\frac{820}{576},\frac{21076}{14400},\frac{773136}{518400},\ldots$$

we see immediately

Euler$\prod$ $\frac{4}{3}*\frac{9}{8}=\frac{36}{24}$ $\frac{p^2}{}$ is in direct contradiction to $\frac{}{!fac^2}$ $\frac{49}{36}$

and

Euler $\prod\frac{1}{1-\frac{1}{p^s}}=\sum\frac{1}{n^s}$ is wrong, we have $\prod\frac{1}{1-\frac{1}{p^s}}\neq\sum\frac{1}{n^s}$

B. Riemann:

<u>Ueber die Anzahl der Primzahlen unter einer gegebenen Grösse</u>

…

Bei dieser Untersuchung diente mir als Ausgangspunkt die von Euler gemachte Bemerkung, dass das Product

$$\prod\frac{1}{1-\frac{1}{p^s}}=\sum\frac{1}{n^s},$$

wenn für p alle Primzahlen, für n alle ganzen Zahlen gesetzt werden. Die Function der complexen Veränderlichen *s*,…

is wrong; the Riemann Hypothesis is false.

… if we look closer to Euler$\prod$

$\frac{p^2}{p^2-1}$ $\rightarrow$ $\frac{n^2}{n^2-1}$ $= \frac{1^2}{0} * \frac{2^2}{3} * \dots$ $= 0$

if n	$\frac{1}{1}$	$\frac{1*4}{1*3}$	$\frac{1*4*9}{1*3*8}$	$\frac{1*4*9*16}{1*3*8*15}$	$\frac{1*4*9*16*25}{1*3*8*15*24}$	…
=	$\frac{1^2}{1}$	$\frac{2^2}{3}$	$\frac{3^2}{6}$	$\frac{4^2}{10}$	$\frac{5^2}{15}$	…

$= \frac{n^2}{zeta(-1)\ at\ n}$ [zeta(– 1) = 1+2+3+4+…]

we have conclusion:

Euler$\prod$ over the primes	$\frac{4}{3}$	$\frac{4*9}{3*8}$	$\frac{4*9*25}{3*8*24}$	…
=				
Euler$\sum$ over the primes	$\frac{2^2}{3}$	$\frac{3^2}{6}$	$\frac{}{11}$	…

; with the o(n)e confusion $\frac{1^2}{0}$ & 1 + 2

in a picture

$\frac{n^2}{zeta(-1)}$	$\frac{1^2}{1}$	$\frac{2^2}{3}$	$\frac{3^2}{6}$	$\frac{4^2}{10}$	$\frac{5^2}{15}$	$\frac{6^2}{21}$	$\frac{7^2}{28}$	$\frac{8^2}{36}$	$\frac{9^2}{45}$	$\frac{10^2}{55}$	$\frac{11^2}{66}$
Euler$\prod$		$\frac{2^2}{3}$	$\frac{6^2}{24}$		$\frac{30^2}{576}$		$\frac{210^2}{27648}$				$\frac{2310^2}{3317760}$
Euler$\sum$		3	6		11		18				29
ζ(2)	$\frac{1}{1^2}$	$\frac{5}{2^2}$	$\frac{49}{6^2}$	$\frac{820}{24^2}$	$\frac{21076}{120^2}$	$\frac{773136}{720^2}$	$\frac{38402064}{5040^2}$				

example 7 is boring

$\frac{n^2}{zeta(-1)}$ $\frac{7^2}{28}$ / $\frac{4^2 * 6^2}{15 * 35}$ = Euler$\prod$ $\frac{210^2}{27648}$

or 28 – 4 + 6 = Euler$\sum$ 18

and

Euler$\prod$ $\frac{210^2}{27648}$ = ζ(2) $\frac{38402064}{5040^2}$ / 24^2

looks weird

π is something like the “Mülleimer” in Mathematics;

X mathematicians have Y formulas for ≈ Z

Leibniz	$\frac{1}{1}-\frac{1}{3}+\frac{1}{5}-\frac{1}{7}+\frac{1}{9}-\ldots$	$=\frac{\pi}{4}$
Euler	$\frac{1}{1^2}+\frac{1}{2^2}+\frac{1}{3^2}+\frac{1}{4^2}+\frac{1}{5^2}+\ldots$	$=\frac{\pi^2}{6}$
Euler$\prod$	$\prod\frac{1}{1-\frac{1}{p^s}}$	$=\frac{\pi^2}{6}$
Ramanujan	$\frac{\sqrt{8}}{9801}*\sum_{n=0}^{\infty}\frac{(4n)!*(1103+26390n)}{(n)!^4*396^{4n}}$	$=\frac{1}{\pi}$
Wallis	$\frac{2}{1}*\frac{2}{3}*\frac{4}{3}*\frac{4}{5}*\frac{6}{5}*\frac{6}{7}*\frac{8}{7}*\frac{8}{9}*\ldots$	$=\frac{\pi}{2}$

…

$\frac{!guyer\ !fac}{!fac}$ is a formula to generate a rational expression at a(n)y point

a approximation

$\zeta(2) = \frac{\pi^2}{6}$ ↔ $\zeta(4) = \frac{\pi^4}{90}$ is a irrational approach

$\pi^2 = \frac{6\,*}{}$ → $\pi^4 = \frac{6^2\,*}{}$ ≠ $\pi^4 = \frac{90\,*}{}$

and irrelevant, but for a solid basis of π we create

G*__uyer Polynom__*

example			! 11	= 39916800	
	6				
5	*	7	= 35		$6^2 - 1^{(2)}$
4	*	8	= (*)32	= 1120	$6^4 - (5 * 6^2) + 2^2$
3	*	9	= (*)27	= 30240	$6^6 - (14 * 6^4) + (49 * 6^2) - 6^2$
2	*	10	= (*)20	= 604800	$6^8 - (30 * 6^6) + (273 * 6^4) - (820 * 6^2) + 24^2$
1	*	11	= (*)11	= 6652800	$6^{10} - (55 * 6^8) + (1023 * 6^6) - (7645 * 6^4) + (21076 * 6^2) - 120^2$
			* 6	= ! 11	

we see

$\zeta(-2)$	&	$\zeta(2)$
$1^2 + 2^2 + 3^2 + 4^2 + 5^2 + \ldots$	I	$\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \frac{1}{5^2} + \ldots = \frac{\pi^2}{6}$
$= 1, 5, 14, 30, 55, \ldots$	I	$= \frac{1}{1^2}, \frac{5}{2^2}, \frac{49}{6^2}, \frac{820}{24^2}, \frac{21076}{120^2}, \ldots = \frac{\pi^2}{6}$
	a Polynom for / with $\frac{\pi^2}{6}$	

the — + n

…

0 * 12 = 0 $6^{12} - (91*6^{10}) + (3003*6^8) - (44473*6^6) + (296296*6^4) - (773136*6^2) + 518400$

shortcut $\pi^2 = G0$

and the formula *example* n 7

$7^{14} - (140*7^{12}) + (7462*7^{10}) - (191620*7^8) + (2475473*7^6) - (15291640*7^4) + (38402064*7^2) - 25401600$

$= 0$

G0 $\frac{38402064 * 6}{25401600}$ $= \pi^2$

how it looks and how it works:

– + 1 h2 – 1

– + 2 h4 – 5*h2 + 4

– + 3 h6 – 14*h4 + 49*h2 – 36

– + 4 h8 – 30*h6 + 273*h4 – 820*h2 + 576

– + 5 h10 – 55*h8 + 1023*h6 – 7645*h4 + 21076*h2 – 14400

– + 6 h12 – 91*h10 + 3003*h8 – 44473*h6 + 296296*h4 – 773136*h2 + 518400

– + 7 ...

example line calculation

– + 4	→	– + 5	– + 5	→	– + 6
$(1*5^2) + 30$	=	55	$(1*6^2) + 55$	=	91
$(30*5^2) + 273$	=	1023	$(55*6^2) + 1023$	=	3003
$(273*5^2) + 820$	=	7645	$(1023*6^2) +7645$	=	44473
$(820*5^2) + 576$	=	21076	$(7645*6^2) + 21076$	=	296296
$(576*5^2)$	=	14400	$(21076*6^2) + 14400$	=	773136
			$(14400*6^2)$	=	518400