

$$n=1,2,3,4 \quad \zeta(3) \doteq 8/7*(1+1/27+1/125+1/343+1/729)=$$

$$1.1992276926223584251\dots\dots$$

$$n=1,2,3,4,5 \quad \zeta(3) \doteq 8/7*(1+1/27+1/125+1/343+1/729+1/1391)=$$

$$1.20004930092060\dots\dots$$

$$n=1,2,3,4,5,6 \quad \zeta(3) \doteq 8/7*(1+1/27+1/125+1/343+1/729+1/1391+1/2197)=$$

$$1.2005694907899045327877\dots\dots$$

$$n=1,2,3,4,5,6,7 \quad \zeta(3) \doteq 8/7*(1+1/27+1/125+1/343+1/729+1/1391+1/2197+1/3375)=$$

$$1.2009081151285288714121\dots\dots$$

$$n=1,2,3,4,5,6,7,8 \quad \zeta(3)=$$

$$8/7*(1+1/27+1/125+1/343+1/729+1/1391+1/2197+1/3375+1/4913)=$$

$$1.20114073412768562754019085\dots\dots\dots$$

.....

$$\zeta(3) = 1.202056903159594285399738161511449\dots\dots\dots$$

and

$$\zeta(5) = \sum_{n=1}^{\infty} \frac{1}{n^5} = 1 + \sum_{n=1}^{\infty} \frac{1}{(2n)^5} + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^5}$$

calculated

$$\sum_{n=1}^{\infty} \frac{1}{n^5} = 1 + \frac{1}{32} \sum_{n=1}^{\infty} \frac{1}{n^5} + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^5} \quad (1)$$

$$\frac{31}{32} \sum_{n=1}^{\infty} \frac{1}{n^5} = 1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^5} \quad (2)$$

$$\zeta(5) = \frac{2^5}{2^5 - 1} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^5} \right)$$

$$n=1, \quad \zeta(5) \doteq 32/31*(1+1/243)= 1.03650604009026948095048\dots\dots$$

$$n=1,2, \quad \zeta(5) \doteq 32/31*(1+1/243+1/3125)=1.03683636267091464224080$$

.....

$$n=1,2,3, \quad \zeta(5) \doteq 32/31*(1+1/243+1/3125+1/16807)=$$

$$1.036897781012350718222972\dots\dots$$

$n=1,2,3,4, \zeta(5) \doteq 32/31*(1+1/243+1/3125+1/16807+1/59049)=$
 $1.0369152623933142591640938344.....$

.....

$\zeta(5) = 1.0369277551433699263313654864570$

and

$$\zeta(7) = \sum_{n=1}^{\infty} \frac{1}{n^7} = 1 + \sum_{n=1}^{\infty} \frac{1}{(2n)^7} + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^7}$$

calculated

$$\zeta(7) = \frac{128}{127} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^7} \right)$$

$$\zeta(7) = \frac{2^7}{2^7 - 1} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^7} \right)$$

$n=1, \zeta(7) \doteq 128/127*(1+1/2187)= 1.0083348634918577.....$

$n=1,2, \zeta(7) \doteq 128/127*(1+1/2187+1/78125)= 1.0083477642792593312667.....$

$n=1,2,3, \zeta(7) \doteq 128/127*(1+1/2187+1/78125+1/823543)=$
 $1.008348988106085311247...$

.....

$\zeta(7) = 1.008349277381922826839.....$

and

$$\zeta(9) = \sum_{n=1}^{\infty} \frac{1}{n^9} = 1 + \sum_{n=1}^{\infty} \frac{1}{(2n)^9} + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^9}$$

calculated

$$\zeta(9) = \frac{512}{511} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^9} \right)$$

$$\zeta(9) = \frac{2^9}{2^9 - 1} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^9} \right)$$

n=1, $\zeta(9) \doteq 512/511 * (1 + 1/3^9) = 512/511 * (1 + 1/19683) = 1.002007851849068001 \dots$

n=1,2, $\zeta(9) \doteq 512/511 * (1 + 1/3^9 + 1/5^9) = 512/511 * (1 + 1/19683 + 1/1953125) =$

1.002008364851024948963577597284 \dots

.....

$\zeta(9) = 1.002008392826082214417852769232412 \dots$

and

$$\zeta(11) = \sum_{n=1}^{\infty} \frac{1}{n^{11}} = 1 + \sum_{n=1}^{\infty} \frac{1}{(2n)^{11}} + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{11}}$$

calculated

$$\zeta(11) = \frac{2048}{2047} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{11}} \right)$$

$$\zeta(11) = \frac{2^{11}}{2^{11} - 1} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{11}} \right)$$

n=1,

$\zeta(11) \doteq 2048/2047 * (1 + 1/3^{11}) = 2048/2047 * (1 + 1/177147) =$

1.00049416757202925667272 \dots

n=1,2,

$\zeta(11) \doteq 2048/2047 * (1 + 1/3^{11} + 1/5^{11}) = 2048/2047 * (1 + 1/177147 + 1/48828125) =$

1.00049418806203414187057225 \dots

.....

$$\zeta(11) = 1.00049418860411946455870228252\dots$$

and

$$\zeta(13) = \sum_{n=1}^{\infty} \frac{1}{n^{13}} = 1 + \sum_{n=1}^{\infty} \frac{1}{(2n)^{13}} + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{13}}$$

calculated

$$\zeta(13) = \frac{8192}{8191} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{13}} \right)$$

$$\zeta(13) = \frac{2^{13}}{2^{13}-1} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{13}} \right)$$

$$n=1, \zeta(13) \doteq 8192/8191 * (1+1/3^{13}) = 8192/8191 * (1+1/1594323) =$$

$$1.0001227125175297488\dots$$

.....

$$\zeta(13) = 1.00012271334757848914675183\dots$$

and,

$$\zeta(15) = \sum_{n=1}^{\infty} \frac{1}{n^{15}} = 1 + \sum_{n=1}^{\infty} \frac{1}{(2n)^{15}} + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{15}}$$

calculated

$$\zeta(15) = \frac{32768}{32767} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{15}} \right)$$

$$\zeta(15) = \frac{2^{15}}{2^{15} - 1} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{15}} \right)$$

$n=1, \zeta(15) \doteq 32768/32767 \cdot (1+1/3^{15}) = 32768/32767 \cdot (1+1/14348907) =$
 $1.0000305882033222608468038 \dots\dots$

.....

$\zeta(15) = 1.0000305882363070204935517 \dots\dots$

and

$$\zeta(17) = \sum_{n=1}^{\infty} \frac{1}{n^{17}} = 1 + \sum_{n=1}^{\infty} \frac{1}{(2n)^{17}} + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{17}}$$

calculated

$$\zeta(17) = \frac{131072}{131071} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{17}} \right) \quad (1)$$

$$\zeta(17) = \frac{2^{17}}{2^{17} - 1} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{17}} \right) \quad (2)$$

$n=1, \zeta(17) \doteq 131072/131071 \cdot (1+1/3^{17}) = 131072/131071 \cdot (1+1/129140163) =$
 $= 2^{17}/2^{17}-1 \cdot (1+1/3^{17}) = 131072/131071 \cdot (1+1/129140163) =$
 $1.0000076371963228089989 \dots\dots$

.....

$\zeta(17) = 1.00000763719763789976227 \dots\dots$

and

$$\zeta(19) = \sum_{n=1}^{\infty} \frac{1}{n^{19}} = 1 + \sum_{n=1}^{\infty} \frac{1}{(2n)^{19}} + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{19}}$$

calculated

$$\zeta(19) = \frac{524288}{524287} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{19}} \right) \quad (1)$$

$$\zeta(19) = \frac{2^{19}}{2^{19}-1} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{19}} \right) \quad (2)$$

$n=1$, $\zeta(19) \doteq 524288/524287 \cdot (1+1/3^{19}) = 524288/524287 \cdot (1+1/1162261467) = 1.00000190821266403655359801\dots\dots$

$\dots\dots$

$\zeta(19) = 1.00000190821271655393892\dots\dots$

And

$$\zeta(21) = \sum_{n=1}^{\infty} \frac{1}{n^{21}} = 1 + \sum_{n=1}^{\infty} \frac{1}{(2n)^{21}} + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{21}}$$

calculated

$$\zeta(21) = \frac{2097152}{2097151} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{21}} \right)$$

$$\zeta(21) = \frac{2^{21}}{2^{21}-1} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{21}} \right)$$

$n=1$, $\zeta(21) \doteq 2^{21}/(2^{21}-1) \cdot (1+1/3^{21}) = 2097152/2097151 \cdot (1+1/10460353203) = 1.0000004769329846888538\dots\dots$

$\dots\dots$

$\zeta(21) = 1.00000047693298678780646\dots\dots$

and

$$\zeta(23) = \sum_{n=1}^{\infty} \frac{1}{n^{23}} = 1 + \sum_{n=1}^{\infty} \frac{1}{(2n)^{23}} + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{23}}$$

calculated

$$\zeta(23) = \frac{8388608}{8388607} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{23}} \right)$$

$$\zeta(23) = \frac{2^{23}}{2^{23} - 1} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{23}} \right)$$

$$n=1, \quad \zeta(23) \doteq 2^{23}/(2^{23}-1) \cdot (1+1/3^{23}) =$$

$$8388608/8388607 \cdot (1+1/94143178827) =$$

$$1.00000011921992588138833106 \dots \dots$$

.....

$$\zeta(23) = 1.000000119219925965311073 \dots \dots$$

And the formula will be

$$\zeta(2m+1) = \sum_{n=1}^{\infty} \frac{1}{n^{2m+1}} = 1 + \sum_{n=1}^{\infty} \frac{1}{(2n)^{2m+1}} + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{2m+1}}$$

calculated

$$\sum_{n=1}^{\infty} \frac{1}{n^{2m+1}} = 1 + \frac{1}{2^{2m+1}} \sum_{n=1}^{\infty} \frac{1}{n^{2m+1}} + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{2m+1}} \quad (1)$$

$$\frac{2^{2m+1} - 1}{2^{2m+1}} \sum_{n=1}^{\infty} \frac{1}{n^{2m+1}} = 1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{2m+1}} \quad (2)$$

$$\zeta(2m+1) = \frac{2^{2m+1}}{2^{2m+1} - 1} \left(1 + \sum_{n=1}^{\infty} \frac{1}{(2n+1)^{2m+1}} \right)$$

n and m=positive integer.

【References】

1) https://en.wikipedia.org/wiki/Riemann_hypothesis



I am a psychiatrist now and also a doctor of brain surgery before.



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I would like to receive an email. I will not answer the phone.

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(I am very poor of English. Almost all document are google-translation.)

When converted to English by Google translation, it becomes cryptic to me.

