New formula of ζ even-numbers

Toshiro Takami*
mmm82889@yahoo.co.jp

abstract
I published the odd value formula for ζ, but I realized that this was true even when it was even. Therefore, it will be announced.

key words
ζ even-numbers, New formula

1 Introduction

I made official previous paper[1].

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

m is a positive integer.
This formula holds for odd numbers, but it may hold for even numbers.

In this case, the formula is transformed as follows:

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

$$(1 - \frac{1}{2^{2m}})\zeta(2m) = (\frac{2^{2m}-1}{2^{2m}})\zeta(2m) = \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{2m}} \tag{3}$$

$$\zeta(2m) = \frac{2^{2m}}{2^{2m}-1} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{2m}} \tag{4}$$

m is a positive integer.

*47-8 Kuyamadai, Isahaya-shi, Nagasaki-prefecture, 854-0067 Japan

If m=1

$$\zeta(2) = \frac{2^2}{2^2-1}\sum_{n=1}^{\infty}\frac{1}{(2n-1)^2} = \frac{4}{3}\sum_{n=1}^{\infty}\frac{1}{(2n-1)^2} \tag{5}$$

If ∞=10
$\zeta(2) \approx 1.611628414....$
If ∞=20
$\zeta(2) \approx 1.628270869...$
If ∞=30
$\zeta(2) \approx 1.633823984...$
$\zeta(2) = 1.644934066...$
∞=30 seemed to be the limit of the calculator.

If m=2

$$\zeta(4) = \frac{16}{15}\sum_{n=1}^{\infty}\frac{1}{(2n-1)^4} \tag{6}$$

If ∞=10
$\zeta(4) \approx 1.082301121...$
If ∞=20
$\zeta(4) \approx 1.082320459...$
If ∞=30
$\zeta(4) \approx 1.0823224...$
$\zeta(4) = 1.0823232...$
∞=30 seemed to be the limit of the calculator.

If m=3

$$\zeta(6) = \frac{64}{63}\sum_{n=1}^{\infty}\frac{1}{(2n-1)^6} \tag{7}$$

If ∞=10
$\zeta(6) \approx 1.01734303062...$
If ∞=20
$\zeta(6) \approx 1.01734306099...$
$\zeta(6) = 1.01734306198...$
∞=20 seemed to be the limit of the calculator.

If m=4

$$\zeta(8) = \frac{256}{255}\sum_{n=1}^{\infty}\frac{1}{(2n-1)^8} \tag{8}$$

If ∞=10

$\zeta(8) \approx 1.00407735614319...$
If ∞=20
$\zeta(8) \approx 1.00407735619750...$
$\zeta(8) = 1.00407735619794...$
∞=20 seemed to be the limit of the calculator.

If m=5

$$\zeta(10) = \frac{1024}{1023} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{10}} \tag{9}$$

If ∞=10
$\zeta(10) \approx 1.00099457512771...$
$\zeta(10) = 1.00099457512781...$
∞=10 seemed to be the limit of the calculator.

If m=6

$$\zeta(12) = \frac{4096}{4095} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{12}} \tag{10}$$

If ∞=10
$\zeta(12) \approx 1.0002460865533078...$
$\zeta(12) = 1.0002460865533080...$
∞=10 seemed to be the limit of the calculator.

If m=7

$$\zeta(14) = \frac{16384}{16383} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{14}} \tag{11}$$

If ∞=10
$\zeta(14) \approx 1.00006124813505870439...$
$\zeta(14) = 1.00006124813505870482...$
∞=10 seemed to be the limit of the calculator.

If m=8

$$\zeta(16) = \frac{65536}{65535} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{16}} \tag{12}$$

If ∞=9
$\zeta(16) \approx 1.000015282259408651846...$
$\zeta(18) = 1.000015282259408651871...$
∞=8 seemed to be the limit of the calculator.

If m=9

$$\zeta(18) = \frac{262144}{262143} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{18}} \tag{13}$$

If ∞=8
$\zeta(18) \approx 1.00000381729326499983977...$
$\zeta(18) = 1.00000381729326499983985...$
∞=8 seemed to be the limit of the calculator.

If m=10

$$\zeta(20) = \frac{1048576}{1048575} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{20}} \tag{14}$$

If ∞=8
$\zeta(20) \approx 1.00000095396203387279611 28...$
$\zeta(20) = 1.00000095396203387279611 31...$

$$\infty$$

=8 seemed to be the limit of the calculator.

If m=11

$$\zeta(22) = \frac{4194304}{4194303} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{22}} \tag{15}$$

If ∞=8
$\zeta(22) \approx 1.00000023845050272773299000 27...$
$\zeta(22) = 1.00000023845050272773299000 36...$
$\infty = 8$ seemed to be the limit of the calculator.

If m=12

$$\zeta(24) = \frac{16777216}{16777215} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{24}} \tag{16}$$

If ∞=8
$\zeta(24) \approx 1.00000005960818905125947961 2437...$
$\zeta(24) = 1.00000005960818905125947961 2440...$
$\infty = 8$ seemed to be the limit of the calculator.

If m=13

$$\zeta(26) = \frac{67108864}{67108863} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{26}} \tag{17}$$

If ∞=6
$\zeta(26) \approx 1.00000001490155482836504123 4647...$
$\zeta(26) = 1.00000001490155482836504123 4658...$
∞=6 seemed to be the limit of the calculator.

If m=14

$$\zeta(28) = \frac{268435456}{268435455} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{28}} \tag{18}$$

If ∞=6
$\zeta(28) \approx 1.00000000372533402478845705481913...$
$\zeta(28) = 1.00000000372533402478845705481920...$
∞=6 seemed to be the limit of the calculator.

If m=15

$$\zeta(30) = \frac{1073741824}{1073741823} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{30}} \tag{19}$$

If ∞=6
$\zeta(30) \approx 1.00000000093132743241966818287176434...$
$\zeta(30) = 1.00000000093132743241966818287176473...$
∞=6 seemed to be the limit of the calculator.

If m=16

$$\zeta(32) = \frac{4294967296}{4294967295} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{32}} \tag{20}$$

If ∞=4
$\zeta(32) \approx 1.00000000023283118336765054919 9...$
$\zeta(32) = 1.00000000023283118336765054920 0...$
∞=4 seemed to be the limit of the calculator.

If m=17

$$\zeta(34) = \frac{17179869184}{17179869183} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{34}} \tag{21}$$

If ∞=4
$\zeta(34) \approx 1.00000000005820772087902700889243 32...$
$\zeta(34) = 1.00000000005820772087902700889243 68...$

∞=4 seemed to be the limit of the calculator.

If m=18

$$\zeta(36) = \frac{68719476736}{68719476735} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{36}} \tag{22}$$

If ∞=4
$\zeta(36) \approx 1.000000000014551921891041984235929 58...$
$\zeta(36) = 1.000000000014551921891041984235929 63...$
∞=4 seemed to be the limit of the calculator.

If m=19

$$\zeta(38) = \frac{274877906944}{274877906943} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{38}} \tag{23}$$

If ∞=4
$\zeta(38) \approx 1.000000000003637979547378651190237235 8...$
$\zeta(38) = 1.000000000003637979547378651190237236 3...$
∞=4 seemed to be the limit of the calculator.

If m=20

$$\zeta(40) = \frac{1099511627776}{1099511627775} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{40}} \tag{24}$$

If ∞=4
$\zeta(40) \approx 1.000000000000909494784026388928253311831 9...$
$\zeta(40) = 1.000000000000909494784026388928253311838 6...$
∞=4 seemed to be the limit of the calculator.

If m=21

$$\zeta(42) = \frac{4398046511104}{4398046511103} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{42}} \tag{25}$$

If ∞=4
$\zeta(42) \approx 1.000000000000227373684582465251522682157714...$
$\zeta(42) = 1.000000000000227373684582465251522682157797...$
∞=4 seemed to be the limit of the calculator.

If m=22

$$\zeta(44) = \frac{17592186044416}{17592186044415} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{44}} \tag{26}$$

If ∞=4
$\zeta(44) \approx 1.00000000000005684341987627585609277182967 4...$
$\zeta(44) = 1.00000000000005684341987627585609277182967 5...$
∞=4 seemed to be the limit of the calculator.

If m=23

$$\zeta(46) = \frac{70368744177664}{70368744177663} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{46}} \tag{27}$$

If ∞=4
$\zeta(46) \approx 1.00000000000001421085482803160676983430714 1726...$
$\zeta(46) = 1.00000000000001421085482803160676983430714 1739...$
∞=4 seemed to be the limit of the calculator.

If m=24

$$\zeta(48) = \frac{281474976710656}{281474976710655} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{48}} \tag{28}$$

If ∞=4
$\zeta(48) \approx 1.00000000000000355271369133711367329846953405 918...$
$\zeta(48) = 1.00000000000000355271369133711367329846953405 934...$
∞=4 seemed to be the limit of the calculator.

If m=25

$$\zeta(50) = \frac{1125899906842624}{1125899906842623} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{50}} \tag{29}$$

If ∞=4
$\zeta(50) \approx 1.00000000000000088817842109308159030960913863913 66...$
$\zeta(50) = 1.00000000000000088817842109308159030960913863913 86...$
∞=4 seemed to be the limit of the calculator.

If m=26

$$\zeta(52) = \frac{4503599627370496}{4503599627370495} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{52}} \tag{30}$$

If ∞=3
$\zeta(52) \approx 1.00000000000000022204460507980419839993200940 9...$
$\zeta(52) = 1.00000000000000022204460507980419839993200942 0...$
∞=3 seemed to be the limit of the calculator.

If m=27

$$\zeta(54) = \frac{18014398509481984}{18014398509481983} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{54}} \tag{31}$$

If ∞=3
$\zeta(54) \approx 1.000000000000000055511151248454812437237365904 8...$
$\zeta(54) = 1.000000000000000055511151248454812437237365905 0...$
∞=3 seemed to be the limit of the calculator.

If m=28

$$\zeta(56) = \frac{72057594037927936}{72057594037927935} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{56}} \tag{32}$$

If ∞=3
$\zeta(56) \approx 1.000000000000000013877787809725232762839094906495...$
$\zeta(56) = 1.000000000000000013877787809725232762839094906500...$
∞=3 seemed to be the limit of the calculator.

If m=29

$$\zeta(58) = \frac{288230376151711744}{288230376151711743} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{58}} \tag{33}$$

If ∞=3
$\zeta(56) \approx 1.000000000000000003469446952165922624744271496109 23...$
$\zeta(58) = 1.000000000000000003469446952165922624744271496109 33...$
∞=3 seemed to be the limit of the calculator.

If m=30

$$\zeta(60) = \frac{1152921504606846976}{1152921504606846975} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{60}} \tag{34}$$

If ∞=3
$\zeta(60) \approx 1.000000000000000000086736173801199337283420550673429 31...$
$\zeta(60) = 1.000000000000000000086736173801199337283420550673429 51...$
∞=3 seemed to be the limit of the calculator.

If m=31

$$\zeta(62) = \frac{4611686018427387904}{4611686018427387903} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{62}} \tag{35}$$

If ∞=3
$\zeta(62) \approx 1.000000000000000000021684043449972197850139101683209841 7...$

$\zeta(62) = 1.000000000000000000021684043449972197850139101683209845 7...$
∞=3 seemed to be the limit of the calculator.

If m=32

$$\zeta(64) = \frac{18446744073709551616}{18446744073709551615} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{64}} \tag{36}$$

If ∞=3
$\zeta(64) \approx 1.000000000000000000054210108624566454109187004043886336 3...$
$\zeta(64) = 1.000000000000000000054210108624566454109187004043886337 1...$
∞=3 seemed to be the limit of the calculator.

If m=33

$$\zeta(66) = \frac{73786976294838206464}{73786976294838206463} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{66}} \tag{37}$$

If ∞=3
$\zeta(66) \approx 1.000000000000000000013552527156101164581485233996826928312...$
$\zeta(66) = 1.000000000000000000013552527156101164581485233996826928329...$
∞=3 seemed to be the limit of the calculator.

If m=34

$$\zeta(68) = \frac{295147905179352825856}{295147905179352825855} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{68}} \tag{38}$$

If ∞=3
$\zeta(68) \approx 1.000000000000000000003388131789020796818085703100450836833...$
$\zeta(68) = 1.000000000000000000003388131789020796818085703100450836834...$
∞=3 seemed to be the limit of the calculator.

If m=35

$$\zeta(70) = \frac{1180591620717411303424}{1180591620717411303423} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{70}} \tag{39}$$

If ∞=3
$\zeta(70) \approx 1.000000000000000000000847032947254699834824699260918216752221 4...$
$\zeta(70) = 1.000000000000000000000847032947254699834824699260918216752228 3...$
∞=3 seemed to be the limit of the calculator.

If m=36

$$\zeta(72) = \frac{4722366482869645213696}{4722366482869645213695} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{72}} \tag{40}$$

If ∞=3
$\zeta(72) \approx 1.000000000000000000000211758236813619473184420943981800258694 03...$
$\zeta(72) = 1.000000000000000000000211758236813619473184420943981800258694 17...$
∞=3 seemed to be the limit of the calculator.

If m=37

$$\zeta(74) = \frac{18889465931478580854784}{18889465931478580854783} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{74}} \tag{41}$$

If ∞=3
$\zeta(74) \approx 1.000000000000000000000052939559203398703238139123029185055866372 7...$
$\zeta(74) = 1.000000000000000000000052939559203398703238139123029185055866375 6...$
∞=3 seemed to be the limit of the calculator.

If m=38

$$\zeta(76) = \frac{75557863725914323419136}{75557863725914323419135} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{76}} \tag{42}$$

If ∞=3
$\zeta(76) \approx 1.000000000000000000000013234889800848990803094510250944989684323 76...$
$\zeta(76) = 1.000000000000000000000013234889800848990803094510250944989684323 82...$
∞=3 seemed to be the limit of the calculator.

If m=39

$$\zeta(78) = \frac{302231454903657293676544}{302231454903657293676543} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{78}} \tag{43}$$

If ∞=3
$\zeta(78) \approx 1.000000000000000000000003308722450212171588946956384314404809276 4881...$
$\zeta(78) = 1.000000000000000000000003308722450212171588946956384314404809276 4894...$
∞=3 seemed to be the limit of the calculator.

If m=40

$$\zeta(80) = \frac{1208925819614629174706176}{1208925819614629174706175} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{80}} \tag{44}$$

If ∞=3
$\zeta(80) \approx 1.000000000000000000000000827180612553034440367110561674407240400 96808...$
$\zeta(80) = 1.000000000000000000000000827180612553034440367110561674407240400 96811...$

∞=3 seemed to be the limit of the calculator.

If m=41

$$\zeta(82) = \frac{48357032784585166988247 04}{48357032784585166988247 03} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{82}} \tag{45}$$

If ∞=2
$\zeta(82) \approx 1.000000000000000000000000020679515313825767043959679193468902...$
$\zeta(82) = 1.000000000000000000000000020679515313825767043959679193468950...$
∞=2 seemed to be the limit of the calculator.

If m=42

$$\zeta(84) = \frac{19342813113834066795298816}{19342813113834066795298815} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{84}} \tag{46}$$

If ∞=2
$\zeta(84) \approx 1.000000000000000000000000005169878828456431320410133216635549...$
$\zeta(84) = 1.000000000000000000000000005169878828456431320410133216635551...$
∞=2 seemed to be the limit of the calculator.

If m=43

$$\zeta(86) = \frac{77371252455336267181195264}{77371252455336267181195263} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{86}} \tag{47}$$

If ∞=2
$\zeta(86) \approx 1.000000000000000000000000001292469707114106670038112611833186 45...$
$\zeta(86) = 1.000000000000000000000000001292469707114106670038112611833186 53...$
∞=2 seemed to be the limit of the calculator.

If m=44

$$\zeta(88) = \frac{30948500982134506872478 1056}{30948500982134506872478 1055} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{88}} \tag{48}$$

If ∞=2
$\zeta(88) \approx 1.000000000000000000000000000323117426778526538613481411802665 7386...$
$\zeta(88) = 1.000000000000000000000000000323117426778526538613481411802665 7417...$
∞=2 seemed to be the limit of the calculator.

If m=45

$$\zeta(90) = \frac{12379400392853802748991242 24}{12379400392853802748991242 23} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{90}} \tag{49}$$

If ∞=2
$\zeta(90) \approx 1.000000000000000000000000000080779356694631620331587381863408997 27...$
$\zeta(90) = 1.000000000000000000000000000080779356694631620331587381863408997 39...$
∞=2 seemed to be the limit of the calculator.

If m=46

$$\zeta(92) = \frac{4951760157141521099596496896}{4951760157141521099596496895} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{92}} \tag{50}$$

If ∞=2
$\zeta(92) \approx 1.000000000000000000000000000020194839173657903491587626465673047513...$
$\zeta(92) = 1.000000000000000000000000000020194839173657903491587626465673047518...$
∞=2 seemed to be the limit of the calculator.

If m=47

$$\zeta(94) = \frac{1980704062856608439838598 7584}{1980704062856608439838598 7583} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{94}} \tag{51}$$

If ∞=2
$\zeta(94) \approx 1.000000000000000000000000000005048709793414475696084771172548660435 8...$
$\zeta(94) = 1.000000000000000000000000000005048709793414475696084771172548660436 0...$

If m=48

$$\zeta(96) = \frac{7922816251426433759354395 0336}{7922816251426433759354395 0335} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{96}} \tag{52}$$

If ∞=2
$\zeta(96) \approx 1.000000000000000000000000000001262177448353618904375399966077714871055...$
$\zeta(96) = 1.000000000000000000000000000001262177448353618904375399966077714871063...$

If m=49

$$\zeta(98) = \frac{3169126500570573503741758013 44}{3169126500570573503741758013 43} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{98}} \tag{53}$$

If ∞=2
$\zeta(98) \approx 1.000000000000000000000000000000315544362088404723910984121848479728143 39...$
$\zeta(98) = 1.000000000000000000000000000000315544362088404723910984121848479728143 71...$

If m=50

$$\zeta(100) = \frac{1267650600228229401496703205376}{1267650600228229401496703205375} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{100}} \tag{54}$$

If ∞=2
$\zeta(100) \approx 1.000000000000000000000000000000078886090522101180735205378276604136878949...$
$\zeta(100) = 1.000000000000000000000000000000078886090522101180735205378276604136878962...$

If m=51

$$\zeta(102) = \frac{5070602400912917605986812821504}{5070602400912917605986812821503} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{102}} \tag{55}$$

If ∞=2
$\zeta(102) \approx 1.000000000000000000000000000000019721522630525295156852383215213909988473 33...$
$\zeta(102) = 1.000000000000000000000000000000019721522630525295156852383215213909988473 84...$

If m=52

$$\zeta(104) = \frac{2028240960365167042394725128 6016}{2028240960365167042394725128 6015} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{104}} \tag{56}$$

If ∞=2
$\zeta(104) \approx 1.000000000000000000000000000000049303806576313237862187667644776975622245754 45...$
$\zeta(104) = 1.000000000000000000000000000000049303806576313237862187667644776975622245754 45...$

If m=53

$$\zeta(106) = \frac{8112963841460668169578900514 4064}{8112963841460668169578900514 4063} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{106}} \tag{57}$$

If ∞=2
$\zeta(106) \approx 1.000000000000000000000000000000012325951644078309459...$
$\zeta(106) = 1.000000000000000000000000000000012325951644078309462...$

If m=54

$$\zeta(108) = \frac{3245185536584267267831560205 76256}{3245185536584267267831560205 76255} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{108}} \tag{58}$$

If ∞=2
$\zeta(108) \approx 1.000000000000000000000000000000030814879110195773651853009095507130250105261 1...$
$\zeta(108) = 1.000000000000000000000000000000030814879110195773651853009095507130250105264 3...$

If m=55

$$\zeta(110) = \frac{1298074214633706907132624082 305024}{1298074214633706907132624082 305023} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{110}} \tag{59}$$

If ∞=2

$\zeta(110) \approx 1.00000000000000000000000000000000007703719777548943412552507549689515008639822 93...$
$\zeta(110) = 1.00000000000000000000000000000000007703719777548943412552507549689515008639823 06...$

If m=56

$$\zeta(112) = \frac{5192296858534827628530496329220096}{5192296858534827628530496329220095} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{112}} \tag{60}$$

If ∞=2
$\zeta(112) \approx 1.00000000000000000000000000000000019259299443872358530924885847349054449873361 87...$
$\zeta(112) = 1.00000000000000000000000000000000019259299443872358530924885847349054449873361 93...$

If m=57

$$\zeta(114) = \frac{207691874341393105141219853168803 84}{207691874341393105141219853168803 83} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{114}} \tag{61}$$

If ∞=2
$\zeta(114) \approx 1.00000000000000000000000000000000004814824860968089632680512236628960478757993506 2...$
$\zeta(114) = 1.00000000000000000000000000000000004814824860968089632680512236628960478757993508 3...$

If m=58

$$\zeta(116) = \frac{830767497365572420564879412675215 36}{830767497365572420564879412675215 35} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{116}} \tag{62}$$

If ∞=2
$\zeta(116) \approx 1.00000000000000000000000000000000001203706215242022408164493700800762027529550608 23...$
$\zeta(116) = 1.00000000000000000000000000000000001203706215242022408164493700800762027529550608 31...$

If m=59

$$\zeta(118) = \frac{3323069989462289682259517650700861 44}{3323069989462289682259517650700861 43} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{118}} \tag{63}$$

If ∞=2
$\zeta(118) \approx 1.00000000000000000000000000000000000300926553810505602039 9...$
$\zeta(118) = 1.00000000000000000000000000000000000300926553810505602040 4...$

If m=60

$$\zeta(120) = \frac{1329227995784915872903807060280344576}{1329227995784915872903807060280344575} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{120}} \tag{64}$$

If ∞=2
$\zeta(120) \approx$
$1.00000000000000000000000000000000000075231638452626400510054786365991407868525312739 9...$

$\zeta(120) =$
1.000000000000000000000000000000000000000075231638452626400510054786365991407868525312740 1...

If m=61

$$\zeta(122) = \frac{5316911983139663491615228241121378304}{5316911983139663491615228241121378303} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{122}} \tag{65}$$

If ∞=2
$\zeta(122) \approx$
1.000000000000000000000000000000000000000188079096131566001275059677048634513410285483111 74...
$\zeta(122) =$
1.000000000000000000000000000000000000000188079096131566001275059677048634513410285483111 80...

If m=62

$$\zeta(124) = \frac{212676479325586539664609129644855132 16}{212676479325586539664609129644855132 15} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{124}} \tag{66}$$

If ∞=2
$\zeta(124) \approx$
1.000000000000000000000000000000000000000047019774032891500318756331610342627662060286712826 4...
$\zeta(124) =$
1.000000000000000000000000000000000000000047019774032891500318756331610342627662060286712828 5...

If m=63

$$\zeta(126) = \frac{850705917302346158658436518579420528 64}{850705917302346158658436518579420528 63} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{126}} \tag{67}$$

If ∞=2
$\zeta(126) \approx$
1.000000000000000000000000000000000000000011754943508222875079688128719050545728002923741473 35...
$\zeta(126) =$
1.000000000000000000000000000000000000000011754943508222875079688128719050545728002923741473 44...

If m=64

$$\zeta(128) = \frac{340282366920938463463374607431768211456}{340282366920938463463374607431768211455} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{128}} \tag{68}$$

If ∞=2
$\zeta(128) \approx$
1.000000000000000000000000000000000000000029387358770557187699219261593698463000750877801376 431...
$\zeta(128) =$
1.000000000000000000000000000000000000000029387358770557187699219261593698463000750877801376 465...

If m=65

$$\zeta(130) = \frac{136112946768375385385349842972707284582 4}{136112946768375385385349842972707284582 3} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{130}} \tag{69}$$

If ∞=2
$\zeta(130) \approx$
1.000000000000000000000000000000000000000000734683969263929692480469759798818227028293257923062 53...
$\zeta(130) =$
1.000000000000000000000000000000000000000000734683969263929692480469759798818227028293257923062 67...

If m=66

$$\zeta(132) = \frac{544451787073501541541399371890829138329 6}{544451787073501541541399371890829138329 5} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{132}} \tag{70}$$

If ∞=2
$\zeta(132) \approx$
1.000000000000000000000000000000000000000001836709923159824231201161310559664069804321754352586 16...
$\zeta(132) =$
1.000000000000000000000000000000000000000001836709923159824231201161310559664069804321754352586 22...

If m=67

$$\zeta(134) = \frac{217780714829400616616559748756331655331 84}{217780714829400616616559748756331655331 83} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{134}} \tag{71}$$

If ∞=2
$\zeta(134) \approx$
1.000000000000000000000000000000000000000000459177480789956057800288873313540295477083925461 3182646...
$\zeta(134) =$
1.000000000000000000000000000000000000000000459177480789956057800288873313540295477083925461 3182668...

If m=68

$$\zeta(136) = \frac{871122859317602466466238995025326621327 36}{871122859317602466466238995025326621327 35} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{136}} \tag{72}$$

If ∞=2
$\zeta(136) \approx$
1.000000000000000000000000000000000000000000114794370197489014450072056736565549205496665825 63764422...
$\zeta(136) =$
1.000000000000000000000000000000000000000000114794370197489014450072056736565549205496665825 63764431...

If m=69

$$\zeta(138) = \frac{348449143727040986586495598010130648530944}{348449143727040986586495598010130648530943} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{138}} \tag{73}$$

If ∞=2
$\zeta(138) \approx$
1.000000000000000000000000000000000000000000028698592549372253612517996229494773449843879
127482537648...
$\zeta(138) =$
1.000000000000000000000000000000000000000000028698592549372253612517996229494773449843879
127482537652...

If m=70

$$\zeta(140) = \frac{139379657490816394634598239204052259412377 6}{139379657490816394634598239204052259412377 6} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{140}} \tag{74}$$

If ∞=2
$\zeta(140) \approx$
1.000000000000000000000000000000000000000000071746481373430634031294970624129584900687 2
764517980168105...
$\zeta(140) =$
1.000000000000000000000000000000000000000000071746481373430634031294970624129584900687 2
764517980168118...

If m=71

$$\zeta(142) = \frac{55751862996326557853839295681620903764951 04}{55751862996326557853839295681620903764951 03} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{142}} \tag{75}$$

If ∞=2
$\zeta(142) \approx$
1.000000000000000000000000000000000000000000017936620343357658507823740439409357478069335356
81450803114...
$\zeta(142) =$
1.000000000000000000000000000000000000000000017936620343357658507823740439409357478069335356
81450803119...

If m=72

$$\zeta(144) = \frac{22300745198530623141535718272648361505980416}{22300745198530623141535718272648361505980415} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{144}} \tag{76}$$

If ∞=2
$\zeta(144) \approx$
1.000000000000000000000000000000000000000000044841550858394146269559348635608906198392805577 00

3868899...
$\zeta(144) =$
1.000000000000000000000000000000000000000000000044841550858394146269559348635608906198392805577003868899...

If m=73

$$\zeta(146) = \frac{8920298079412249256614287309059344602392166 4}{8920298079412249256614287309059344602392166 3} \sum_{n=1}^{\infty} \frac{1}{(2n-1)^{146}} \tag{77}$$

If ∞=2
$\zeta(146) \approx$
1.000000000000000000000000000000000000000000000011210387714598536567389836885245061272178142485817216754...
$\zeta(146) =$
1.000000000000000000000000000000000000000000000011210387714598536567389836885245061272178142485817216754...

The computer can't give me any more precision.

2 Conclusion

The odd formula for ζ has been released, but it has become clear that this is true even when it is even.

3 Appendices

I use WolframAlpha for calculation.

References

[1] B.Riemann.: Uber die Anzahl der Primzahlen unter einer gegebenen Grosse, Mon. Not. Berlin Akad pp.671-680, 1859

[2] John Derbyshire.: Prime Obsession: Bernhard Riemann and The Greatest Unsolved Problem in Mathematics, Joseph Henry Press, 2003

[3] S.Kurokawa.: Riemann hypothesis, Japan Hyoron Press, 2009

[4] Marcus du Sautoy.: The Music of The Primes, Zahar Press, 2007

[5] T. takami.: Formula of ζ Odd-Numbers, viXra:1909.0385

[6] T. takami.: $\zeta(5), \zeta(7), ...\zeta(331), \zeta(333)$ are Irrational Number, viXra:1909.0315