

# Wilks Coefficient Formula Chart for Men

**Published:** Monday, 23 April 2012, by Gordon Wayne Watts of Lakeland, Florida, U.S.A. (between Tampa & Orlando, Fla.) – [www.GordonWatts.com](http://www.GordonWatts.com) / [www.GordonWayneWatts.com](http://www.GordonWayneWatts.com)

**Last Updated:** Wednesday, 25 April 2012

There were two (2) updates added:

#1 – I added the Kutin correction for applying the Watts coefficient to non-hollow 3-Dimensional objects, and also:

#2 – I offered clarification on some definitions.

These coefficients, developed by Robert Wilks, of Australia, are widely used in powerlifting to determine the best lifter (or best individual lift), when comparing lifters of different bodyweights.

To use the chart, you look on the chart for the “Wilks Coefficient” for the lifter’s bodyweight in kilograms. (Note: To convert the Wilks coefficients for use with pounds, take the number of pounds a lifter weighs, and divide by 2.2046 to get the number of kilograms the lifter weighs.) Then, once you’ve found the proper coefficient, you multiply that number by the lifter’s total. The resulting number is the lifter’s “Wilks total,” and whoever has the largest total (or individual lift) is considered “the best lifter by Wilks” (as there are other formulas used) – or simply the “best lifter.”

For example, if a 40-kg lifter has a total of 200 kg, and an 80-kg lifter has a total of 398 kg, one might initially think that the lighter lifter is stronger (since he lifted 5-times his own bodyweight, whereas the 80-kg lifter lifted only 4.975-times his own bodyweight). However, the lighter lifter only has a “Wilks total” of 1.335422866287198030-times-200-kg, or a 267.084573257439606-kg Wilks total. On the other hand, the heavier lifter has a “Wilks total” of 0.682698590168316912-times-398-kg, or a 271.714038886990130976-kg Wilks total, slightly larger than that of the other lifter. So, the heavier lifter, even though he didn’t quite lift 5-times his bodyweight, like the lighter lifter, would nonetheless be declared the “best lifter” by the Wilks formula.

Here are the formulas used for all the coefficients shown on the included graph:

**WILKS Coefficient for men** =  $(500)/[(-216.0475144) + (16.2606339*x) - (0.002388645*x^2) - (0.00113732*x^3) + (0.00000701863*x^4) - (0.00000001291*x^5)]$   
(Shown in blue on the included graph: Blue for boys)

Where x = bodyweight in kilograms (both here and below)

**WILKS Coefficient for women** =  $(500)/[(594.31747775582) - (27.23842536447*x) + (0.82112226871*x^2) - (0.00930733913*x^3) + (0.00004731582*x^4) - (0.00000009054*x^5)]$   
(Shown in pink on the included graph: Pink for girls)

**Note:** I have no idea how Wilks derives the factors for his equation, but I suspect that he took a lot of available data from powerlifting competitions, and asked a computer to model a 'best-fit' 5th-order equation to match the data.

**WATTS Coefficient for men** =  $[(51.075/x)^{(2/3)}] \rightarrow$  (Caution: Strange, mind-bending “math-talk” follows...)  
(Shown in green on the included graph: Green for Gordon – as in Gordon Wayne Watts, the creator of the WATTS coefficient.)

**Note:** While I have no idea how Wilks derives **his** coefficients, I **can** give an explanation for **my** formula: First off, since Wilks' formula is very widely used, and his coefficient for men is 1.00 at a weight close to 51.075-kg (estimated to the nearest 25-thousandths by manual calculation), I have “normalized” my calculations to match his as closely as reasonably possible at this weight. Then, noting that surface area is a limiting factor of how much one can lift (due to the fact that the lifter is supporting the weight by the surface-area of his or her skin and structure), and surface area is merely a squared function, not a cubed function, its affect can be approximated by taking the ratio in mass and raising it to the 2/3rds-power. For example, is a Rubik's Cube of 2x2x2 inches square was placed on the ground and made to support a weight, its base and top (both under applied pressure) would only be four-square inches (2x2), not eight (its mass), and thus only be expected to support FOUR times as more weight than a smaller cube of 1x1x1 inches square (NOT eight, the ratio of difference in masses). So, here, the mass ratio, 8, is raised to the 2/3rds-power, and results in a factor of 4, as demonstrated above. Thus, the WATTS Coefficient Formula Chart for Men uses this 2/3rds-power correction factor. NOTE: Other factors (limb length, asymmetrical increases, possible hormonal differences, etc.) might affect strength, since the body does not necessarily hold the same shape as mass increases. Also, the ROM (range of motion) of a larger lifter changes, which affects things, particularly, the deadlift, where shorter lifters are closer to lockout at the start of the lift. Therefore, I do not know if the WATTS formula is more accurate than the WILKS formula in determining “best lifter.” It is only a hypothesis, guess, theory, or “best guesstimate” as to whether my formula is more accurate: Only by a review of recent lifting competitions could this theory be tested. In any event, the included graphs demonstrate that the WATTS coefficient is quite close to the WILKS coefficient FOR ALL VALUES in the range of lifters' weights listed, and that for real light lifters (under about 51.0-kg) and real heavy lifters (above about 115.6-kg), the WILKS coefficient is slightly more helpful to them, but in between about 51.0-kg and 115.6-kg (that is, for most lifters), the WATTS coefficient is more helpful to them. While it is uncertain if the WATTS coefficient is more accurate, it (first) is based on solid laws of physics, and, (second) per Ockham's Razor, has a simple explanation, and (third and lastly) is very close to the widely-used Wilks formula; so, good evidences supports the (as yet untested) theory that the Watts coefficient **might possibly** be more accurate in comparing lifters of different weights and/or genders than the more widely-used Wilks formula.

**#1 – First UPDATE:** Since publishing this initially, I have found some errors in my initial application of the 'Watts coefficient.' – My friend, Ed Kutin, a very smart powerlifter, apparently paid attention in his math, physics, and statistics classes when studying for his vocation in financial service, and he gave me excellent feedback when I asked for his thoughts on my formula – Ed said: “In particular, to use your rubik's cube example, your assertion is correct only if the cubes are hollow. As people are not hollow, the example breaks down.” – I **now think I know how to correct for that:** When taking a lift, and then thinking about multiplying it by the Watts coefficient (like you would do for the Wilks coefficient), you must **\*first\*** add the person's body-weight to the lift – for, after all, the lifter is **\_always\_** lifting (or at least supporting) his or her body-weight AND the weight being lifted. In a squat, for example, the lifter would be squatting at least his/her upper body mass. And, in the bench press, only the arms would 'add to' the weight being lifted, but the lifter's **\*full\*** body-weight is still supported by his/her back -as it comes in contact with the bench press bench.

For example, if a 40-kg lifter has a total of 200 kg, and an 80-kg lifter has a total of 398 kg, one might initially apply the Watts coefficient as follows:

Lighter lifter has a WATTS total of:  $1.176970531562958400\text{-times-}200\text{-kg} = 235.39410631259168\text{-kg 'Watts total'}$

Heavier lifter has a WATTS total of:  $0.741444973911064752\text{-times-}398\text{-kg} = 295.095099616603771296\text{-kg 'Watts total'}$  (note that while the heavier lifter wins using both Wilks and Watts, he wins by a much larger margin with the Watts formula, since Wilks favors very light lifters more.)

However, each lifter is also carrying around his bodyweight, so that must be accounted for – here is an example of how to do so:

Lighter lifter has a WATTS total of:  $1.176970531562958400\text{-times-}(200 + 40 + 40 + 40)\text{ kg}$  (add his bodyweight three times, once for each power-lift)

Lighter lifter has a WATTS total of:  $1.176970531562958400\text{-times-}(320\text{-kg}) = 376.630570100146688\text{-kg WATTS total, with the Kutin bodyweight correction applied.}$

Heavier lifter has a WATTS total of:  $0.741444973911064752\text{-times-}(398 + 80 + 80 + 80)\text{ kg}$  (add his bodyweight three times, once for each power-lift)

Heavier lifter has a WATTS total of:  $0.741444973911064752\text{-times-}(638\text{-kg}) = 473.041893355259311776$

So, you can see here that merely using the Watts coefficient, the heavier lifter won by a factor of 1.2536, but when you apply the Kutin application correction for non-hollow 3-dimensional objects, he wins by a factor of 1.25598, slightly better, since he was also supporting more mass per surface area, being a larger lifter (and the Kutin correction accounted for that).

As an extreme case, remember the Rukik's cube example: When doubling the height, the volume goes up eight (8) times, whereas the surface area only goes up four (4) times, thus the increase in weight supported per surface area increases in a linear fashion -for heavier lifters. **Math is cool! :D**

So, I shall give my friend, Ed Kutin, credit for giving me the idea. You can Google his name to see what he's up to. Recently, he coached his 10-year old daughter, Naomi, to a world record in the squat. Yes, a 'World' record (not merely an age-class record), as she beat a 44-year old German lady for the record. Her height confers good leverage advantages, to be sure, but you can be sure that she worked hard training (and her father worked hard coaching) to help a 10-year-old grade school student to beat a middle-aged powerlifting champion, while adhering to safe and healthy training methods. (His son is also setting records in his age class.) So, you can be sure that Ed knows about powerlifting!

So, of course, to test the accuracy of either version of WATTS or compare it with WILKS, you would have to review some recent powerlifting competitions. If a comparison formula is accurate, you would expect all of the champions to have similar values, and that a linear regression of the data points would produce a graph plot that has a flat slope and a very low p-value, and a very high 'R' value (indicating a tight pattern). The more accurate a formula, the closer the slope (of score versus bodyweight) would approach zero, and the lower the p-value, and the higher the 'R' value. This would allow comparison of WILKS and either version of WATTS. **(End of 1<sup>st</sup> update.)**

**WATTS Coefficient for women** – Since so many complex hormonal 'chemical' and 'biological' factors are involved here, an exact formula is impossible for mere mortals. (It was difficult enough

simply correcting for the laws of 'physics' relative to differences in physical size for the men's formula.) Rather → When computing values for women, use the following method: Compute a "tentative" value, using the men's value, and then, using several recent years of results from strictly-tested drug-free powerlifting federations, obtain the average values for the top finishers in both men's and women's competitions for the weight-class in question, and take the average for each, obtaining an overall "men's average" and an overall "women's average" of the top several finishers over a period of several recent years. Then, take the ratio of the men's average to the women's average, which should yield a number slightly greater than 1.0, and use this "gender-correction" factor to "boost up" the previous 'tentative' final result you just calculated using the men's value by multiplying the "correction factor" by your previous result. This final result should make comparison of women's results on level playing ground. **CAVEAT:** When calculating averages from recent powerlifting competitions, it is imperative to ensure these are strictly-tested drug-free competitions. If this is not done, then results will be inaccurate, since the women's averages will more closely approach the men's averages, thus unfairly raising the bar, and biasing the results against the women who are trying to be fairly compared here.

**(NOT shown on the included graph.)**

**REDNECK Coefficient for men** =  $[51.075/x]$  (Note: The 'Redneck coefficient for men' merely measures "pound-for-pound" comparison, so, for example, a lifter who weighs 102.15-kg will have a coefficient exactly half that of a lifter weighing 51.075-kg. This is because Rednecks are just dumb hillbilly country bumpkins who INCORRECTLY think that lifting ability goes up as a linear function with weight or mass – It does not: For example, the Empire State Building weighs a lot more than an average powerlifter, yet this structure can NOT support five (5) times its own weight like some elite-level men's powerlifters. Heck, it can BARELY supports its **\*\*own\*\*** weight, since, of course, the base of the structure's surface area is merely a 2<sup>nd</sup>-order, "squared" function, whereas the mass (e.g., weight) of the structure is a 3<sup>rd</sup>-order, "cubed" function. A small ant, by contrast, can pick up around a HUNDRED times its own bodyweight, for the same reason here, based on the laws of physics.)

**(Shown in red on the included graph: Red for redneck.)**

**REDNECK Coefficient for women** – Since country-bumpkin hillbillies Rednecks are really not that smart (heck, I should know: I am one!), there IS no 'coefficient for women' – Actually, their coefficient for men is NOT accurate, so why would they be smart enough to make one for women? LOL

**(NOT shown on the included graph.)**

**#2 – Second UPDATE:** Since publishing this initially, I also noticed that I might have foreign readers (who do not speak English as their native language), and, as such, I should define terms like "Redneck."

**Redneck** – An informal slang term used in reference to poor, rural, working-class, uneducated, and usually White, farmers, especially from the southern United States. Synonyms include 'cracker' (especially regarding Georgia and Florida) and 'hillbilly' (especially regarding Appalachia and the Ozarks).

**Hillbilly** – A colloquial slang term for a person from the backwoods or a remote mountain area.

**Country bumpkin** – A derogatory or insulting term for an uneducated person, usually from a small, backwoods southern United States town out in the country; someone who speaks or behaves in a manner that indicates lack of understanding of the ever changing, modern world and who does not have much experience of city life.

*Synonyms for 'country bumpkin' include hayseed, chawbacon, rube, redneck, hick, yokel, village, villager, countryman, countrywoman, bumpkin, country cousin, and backwoodsman.*

**Google image search:** [http://www.google.com/search?q=country+bumpkin&um=1&ie=UTF-8&hl=en&tbn=isch&source=og&sa=N&tab=wi&ei=r6KXT5SKNbKq0AGHL-T5Bq&biw=1680&bih=955&sej=sqKXT5xb56jQAeCjuNkG#um=1&hl=en&tbn=isch&sa=1&q=country+bumpkin+redneck+hillbilly&aq=f&aqi=&aql=&gs\\_l=img.3...5921.8179.5.8288.10.10.0.0.0.0.0.PXkqUcvtk&pbx=1&bav=on.2.orr\\_gc.r\\_pwr.qf.cf.osb&fp=e29e530bea455f63&biw=1680&bih=955](http://www.google.com/search?q=country+bumpkin&um=1&ie=UTF-8&hl=en&tbn=isch&source=og&sa=N&tab=wi&ei=r6KXT5SKNbKq0AGHL-T5Bq&biw=1680&bih=955&sej=sqKXT5xb56jQAeCjuNkG#um=1&hl=en&tbn=isch&sa=1&q=country+bumpkin+redneck+hillbilly&aq=f&aqi=&aql=&gs_l=img.3...5921.8179.5.8288.10.10.0.0.0.0.0.PXkqUcvtk&pbx=1&bav=on.2.orr_gc.r_pwr.qf.cf.osb&fp=e29e530bea455f63&biw=1680&bih=955)

**Yahoo! Image search:** [http://images.search.yahoo.com/search/images\\_vlt=A0oG7h0Fo5dP5EkAZ5JXNvoA?p=country+bumpkin+redneck+hillbilly&fr=vfp-t-701&fr2=piv-web](http://images.search.yahoo.com/search/images_vlt=A0oG7h0Fo5dP5EkAZ5JXNvoA?p=country+bumpkin+redneck+hillbilly&fr=vfp-t-701&fr2=piv-web)

(Click on those Internet IMAGE searches – they are funny!)

**(End of 2<sup>nd</sup> update.)**

Here is the graphing program I used:  
Graph, version 4.3, build 384, Copyright © 2007  
by: <http://www.padowan.dk>  
Copyright © 2009 by Ivan Johansen

For further information – Related links:  
[http://en.wikipedia.org/wiki/Wilks\\_Coefficient](http://en.wikipedia.org/wiki/Wilks_Coefficient)

<http://www.powerliftingwatch.com/node/780>

<http://www.powerlifting-ipf.com/fileadmin/data/Downloads/Wilksformula.pdf>

Bodyweight in kilograms (kg)	Wilks formula for men
40.0	1.335422866287198030
40.1	1.331073584150518150
40.2	1.326758160010707220
40.3	1.322476215539588220
40.4	1.318227378030363030
40.5	1.314011280293613990
40.6	1.309827560555605620
40.7	1.305675862358827160
40.8	1.301555834464718690
40.9	1.297467130758524960
41.0	1.293409410156222940
41.1	1.289382336513470500
41.2	1.285385578536525280
41.3	1.281418809695083960
41.4	1.277481708136994160
41.5	1.273573956604791900
41.6	1.269695242354019270
41.7	1.265845257073278310
41.8	1.262023696805977980
41.9	1.258230261873732710
42.0	1.254464656801371850
42.1	1.250726590243520860

42.2	1.247015774912715620
42.3	1.243331927509013010
42.4	1.239674768651061180
42.5	1.236044022808594640
42.6	1.232439418236319700
42.7	1.228860686909157100
42.8	1.225307564458809330
42.9	1.221779790111621260
43.0	1.218277106627703290
43.1	1.214799260241287260
43.2	1.211346000602286170
43.3	1.207917080719029230
43.4	1.204512256902145040
43.5	1.201131288709565920
43.6	1.197773938892627430
43.7	1.194439973343237710
43.8	1.191129161042091980
43.9	1.187841274007908040
44.0	1.184576087247659540
44.1	1.181333378707784070
44.2	1.178112929226343920
44.3	1.174914522486117830
44.4	1.171737944968602840
44.5	1.168582985908905390
44.6	1.165449437251502020
44.7	1.162337093606849870
44.8	1.159245752208828280
44.9	1.156175212872992710
45.0	1.153125277955623150
45.1	1.150095752313549340
45.2	1.147086443264735670
45.3	1.144097160549609050
45.4	1.141127716293113530
45.5	1.138177924967475690
45.6	1.135247603355665340
45.7	1.132336570515536510
45.8	1.129444647744633870
45.9	1.126571658545650320
46.0	1.123717428592521670
46.1	1.120881785697144850
46.2	1.118064559776706080
46.3	1.115265582821606350
46.4	1.112484688863971130
46.5	1.109721713946732260
46.6	1.106976496093269650
46.7	1.104248875277601240
46.8	1.101538693395109530
46.9	1.098845794233793530
47.0	1.096170023446035130
47.1	1.093511228520869190
47.2	1.090869258756746920
47.3	1.088243965234782300
47.4	1.085635200792471560
47.5	1.083042819997876140
47.6	1.080466679124259330
47.7	1.077906636125167680
47.8	1.075362550609947770
47.9	1.072834283819689700
48.0	1.070321698603588620
48.1	1.067824659395715740
48.2	1.065343032192190700
48.3	1.062876684528747200
48.4	1.060425485458683860

48.5	1.057989305531192940
48.6	1.055568016770058970
48.7	1.053161492652720350
48.8	1.050769608089686400
48.9	1.048392239404303030
49.0	1.046029264312860130
49.1	1.043680561905033870
49.2	1.041346012624657520
49.3	1.039025498250814150
49.4	1.036718901879245160
49.5	1.034426107904068370
49.6	1.032147001999799710
49.7	1.029881471103672600
49.8	1.027629403398249420
49.9	1.025390688294319250
50.0	1.023165216414076580
50.1	1.020952879574575550
50.2	1.018753570771454400
50.3	1.016567184162925130
50.4	1.014393615054023240
50.5	1.012232759881112660
50.6	1.010084516196641090
50.7	1.007948782654141010
50.8	1.005825458993471700
50.9	1.003714446026297960
51.0	1.001615645621800800
51.1	0.999528960692616129
51.2	0.997454295180996924
51.3	0.995391554045194931
51.4	0.993340643246057756
51.5	0.991301469733837413
51.6	0.989273941435206442
51.7	0.987257967240477786
51.8	0.985253456991024722
51.9	0.983260321466897195
52.0	0.981278472374630972
52.1	0.979307822335246156
52.2	0.977348284872431601
52.3	0.975399774400911897
52.4	0.973462206214993641
52.5	0.971535496477287771
52.6	0.969619562207604820
52.7	0.967714321272019999
52.8	0.965819692372105090
52.9	0.963935595034324189
53.0	0.962061949599590391
53.1	0.960198677212980580
53.2	0.958345699813605537
53.3	0.956502940124632634
53.4	0.954670321643458440
53.5	0.952847768632028620
53.6	0.951035206107302554
53.7	0.949232559831860159
53.8	0.947439756304648450
53.9	0.945656722751865407
54.0	0.943883387117978797
54.1	0.942119678056877610
54.2	0.940365524923153830
54.3	0.938620857763512319
54.4	0.936885607308306611
54.5	0.935159704963198469
54.6	0.933443082800939108
54.7	0.931735673553270002

54.8	0.930037410602941269
54.9	0.928348227975845632
55.0	0.926668060333266011
55.1	0.924996842964234842
55.2	0.923334511778003244
55.3	0.921681003296618189
55.4	0.920036254647605891
55.5	0.918400203556759620
55.6	0.916772788341030226
55.7	0.915153947901517661
55.8	0.913543621716561828
55.9	0.911941749834931127
56.0	0.910348272869107077
56.1	0.908763131988663448
56.2	0.907186268913738345
56.3	0.905617625908597737
56.4	0.904057145775288925
56.5	0.902504771847382494
56.6	0.900960447983801320
56.7	0.899424118562735203
56.8	0.897895728475639763
56.9	0.896375223121318226
57.0	0.894862548400084777
57.1	0.893357650708008163
57.2	0.891860476931234272
57.3	0.890370974440386409
57.4	0.888889091085042056
57.5	0.887414775188284871
57.6	0.885947975541330761
57.7	0.884488641398226835
57.8	0.883036722470622093
57.9	0.881592168922608730
58.0	0.880154931365632929
58.1	0.878724960853474060
58.2	0.877302208877291227
58.3	0.875886627360736083
58.4	0.874478168655130909
58.5	0.873076785534710927
58.6	0.871682431191929854
58.7	0.870295059232827716
58.8	0.868914623672459967
58.9	0.867541078930386962
59.0	0.866174379826222855
59.1	0.864814481575243025
59.2	0.863461339784049105
59.3	0.862114910446290766
59.4	0.860775149938443374
59.5	0.859442015015640666
59.6	0.858115462807561625
59.7	0.856795450814370720
59.8	0.855481936902710716
59.9	0.854174879301747247
60.0	0.852874236599264389
60.1	0.851579967737810457
60.2	0.850292032010893276
60.3	0.849010389059224188
60.4	0.847734998867010068
60.5	0.846465821758292631
60.6	0.845202818393334330
60.7	0.843945949765050159
60.8	0.842695177195484673
60.9	0.841450462332333563
61.0	0.840211767145509130

61.1	0.838979053923749009
61.2	0.837752285271267517
61.3	0.836531424104448989
61.4	0.835316433648582499
61.5	0.834107277434637360
61.6	0.832903919296078805
61.7	0.831706323365723272
61.8	0.830514454072632721
61.9	0.829328276139047407
62.0	0.828147754577356567
62.1	0.826972854687106474
62.2	0.825803542052045307
62.3	0.824639782537204333
62.4	0.823481542286014855
62.5	0.822328787717460443
62.6	0.821181485523263917
62.7	0.820039602665108612
62.8	0.818903106371893423
62.9	0.817771964137021158
63.0	0.816646143715719729
63.1	0.815525613122395716
63.2	0.814410340628019843
63.3	0.813300294757543929
63.4	0.812195444287348865
63.5	0.811095758242723185
63.6	0.810001205895371799
63.7	0.808911756760954480
63.8	0.807827380596653677
63.9	0.806748047398771253
64.0	0.805673727400353751
64.1	0.804604391068845790
64.2	0.803540009103771195
64.3	0.802480552434441501
64.4	0.801425992217691425
64.5	0.800376299835640963
64.6	0.799331446893483732
64.7	0.798291405217301201
64.8	0.797256146851902461
64.9	0.796225644058689187
65.0	0.795199869313545446
65.1	0.794178795304752009
65.2	0.793162394930924859
65.3	0.792150641298977530
65.4	0.791143507722106995
65.5	0.790140967717802761
65.6	0.789142995005878863
65.7	0.788149563506528458
65.8	0.787160647338400720
65.9	0.786176220816699711
66.0	0.785196258451304976
66.1	0.784220734944913540
66.2	0.783249625191203036
66.3	0.782282904273015687
66.4	0.781320547460562858
66.5	0.780362530209649911
66.6	0.779408828159921099
66.7	0.778459417133124228
66.8	0.777514273131394829
66.9	0.776573372335559593
67.0	0.775636691103458802
67.1	0.774704205968287529
67.2	0.773775893636955332
67.3	0.772851730988464242

67.4	0.771931695072304763
67.5	0.771015763106869689
67.6	0.770103912477885485
67.7	0.769196120736861013
67.8	0.768292365599553372
67.9	0.767392624944450654
68.0	0.766496876811271365
68.1	0.765605099399480324
68.2	0.764717271066820828
68.3	0.763833370327862850
68.4	0.762953375852567101
68.5	0.762077266464864732
68.6	0.761205021141252473
68.7	0.760336619009403041
68.8	0.759472039346790587
68.9	0.758611261579331026
69.0	0.757754265280037036
69.1	0.756901030167687560
69.2	0.756051536105511619
69.3	0.755205763099886259
69.4	0.754363691299048452
69.5	0.753525300991820790
69.6	0.752690572606350778
69.7	0.751859486708863573
69.8	0.751032024002428006
69.9	0.750208165325735698
70.0	0.749387891651893136
70.1	0.748571184087226536
70.2	0.747758023870099325
70.3	0.746948392369742114
70.4	0.746142271085094976
70.5	0.745339641643661905
70.6	0.744540485800377291
70.7	0.743744785436484269
70.8	0.742952522558424796
70.9	0.742163679296741317
71.0	0.741378237904989874
71.1	0.740596180758664519
71.2	0.739817490354132899
71.3	0.739042149307582874
71.4	0.738270140353980034
71.5	0.737501446346035989
71.6	0.736736050253187288
71.7	0.735973935160584865
71.8	0.735215084268093859
71.9	0.734459480889303696
72.0	0.733707108450548315
72.1	0.732957950489936405
72.2	0.732211990656391548
72.3	0.731469212708702128
72.4	0.730729600514580922
72.5	0.729993138049734229
72.6	0.729259809396940435
72.7	0.728529598745137912
72.8	0.727802490388522121
72.9	0.727078468725651832
73.0	0.726357518258564334
73.1	0.725639623591899550
73.2	0.724924769432032929
73.3	0.724212940586217034
73.4	0.723504121961731715
73.5	0.722798298565042762
73.6	0.722095455500968953

73.7	0.721395577971857382
73.8	0.720698651276766987
73.9	0.720004660810660178
74.0	0.719313592063602460
74.1	0.718625430619969978
74.2	0.717940162157664881
74.3	0.717257772447338415
74.4	0.716578247351621659
74.5	0.715901572824363821
74.6	0.715227734909877992
74.7	0.714556719742194294
74.8	0.713888513544320325
74.9	0.713223102627508812
75.0	0.712560473390532405
75.1	0.711900612318965527
75.2	0.711243505984473186
75.3	0.710589141044106691
75.4	0.709937504239606181
75.5	0.709288582396709889
75.6	0.708642362424470081
75.7	0.707998831314575569
75.8	0.707357976140680750
75.9	0.706719784057741082
76.0	0.706084242301354929
76.1	0.705451338187111708
76.2	0.704821059109946263
76.3	0.704193392543499393
76.4	0.703568326039484480
76.5	0.702945847227060134
76.6	0.702325943812208792
76.7	0.701708603577121215
76.8	0.701093814379586804
76.9	0.700481564152389681
77.0	0.699871840902710465
77.1	0.699264632711533683
77.2	0.698659927733060761
77.3	0.698057714194128518
77.4	0.697457980393633116
77.5	0.696860714701959405
77.6	0.696265905560415601
77.7	0.695673541480673234
77.8	0.695083611044212322
77.9	0.694496102901771702
78.0	0.693911005772804470
78.1	0.693328308444938469
78.2	0.692747999773441774
78.3	0.692170068680693120
78.4	0.691594504155657217
78.5	0.691021295253364909
78.6	0.690450431094398101
78.7	0.689881900864379442
78.8	0.689315693813466670
78.9	0.688751799255851602
79.0	0.688190206569263706
79.1	0.687630905194478200
79.2	0.687073884634828651
79.3	0.686519134455723995
79.4	0.685966644284169967
79.5	0.685416403808294861
79.6	0.684868402776879603
79.7	0.684322630998892063
79.8	0.683779078343025590
79.9	0.683237734737241704



80.0	0.682698590168316912
80.1	0.682161634681393603
80.2	0.681626858379534971
80.3	0.681094251423283946
80.4	0.680563804030226058
80.5	0.680035506474556228
80.6	0.679509349086649421
80.7	0.678985322252635124
80.8	0.678463416413975624
80.9	0.677943622067048029
81.0	0.677425929762730006
81.1	0.676910330105989185
81.2	0.676396813755476208
81.3	0.675885371423121372
81.4	0.675375993873734826
81.5	0.674868671924610308
81.6	0.674363396445132357
81.7	0.673860158356386986
81.8	0.673358948630775767
81.9	0.672859758291633304
82.0	0.672362578412848051
82.1	0.671867400118486445
82.2	0.671374214582420321
82.3	0.670883013027957572
82.4	0.670393786727476027
82.5	0.669906527002060508
82.6	0.669421225221143037
82.7	0.668937872802146167
82.8	0.668456461210129388
82.9	0.667976981957438605
83.0	0.667499426603358624
83.1	0.667023786753768649
83.2	0.666550054060800732
83.3	0.666078220222501163
83.4	0.665608276982494770
83.5	0.665140216129652087
83.6	0.664674029497759382
83.7	0.664209708965191494
83.8	0.663747246454587473
83.9	0.663286633932528973
84.0	0.662827863409221398
84.1	0.662370926938177743
84.2	0.661915816615905127
84.3	0.661462524581593984
84.4	0.661011043016809882
84.5	0.660561364145187949
84.6	0.660113480232129879
84.7	0.659667383584503491
84.8	0.659223066550344822
84.9	0.658780521518562723
85.0	0.658339740918645933
85.1	0.657900717220372614
85.2	0.657463442933522316
85.3	0.657027910607590354
85.4	0.656594112831504569
85.5	0.656162042233344452
85.6	0.655731691480062608
85.7	0.655303053277208540
85.8	0.654876120368654724
85.9	0.654450885536324965
86.0	0.654027341599924992
86.1	0.653605481416675296
86.2	0.653185297881046168

86.3	0.652766783924494930
86.4	0.652349932515205329
86.5	0.651934736657829075
86.6	0.651521189393229516
86.7	0.651109283798227400
86.8	0.650699012985348744
86.9	0.650290370102574749
87.0	0.649883348333093774
87.1	0.649477940895055335
87.2	0.649074141041326105
87.3	0.648671942059247914
87.4	0.648271337270397709
87.5	0.647872320030349474
87.6	0.647474883728438076
87.7	0.647079021787525035
87.8	0.646684727663766183
87.9	0.646291994846381211
88.0	0.645900816857425073
88.1	0.645511187251561235
88.2	0.645123099615836756
88.3	0.644736547569459180
88.4	0.644351524763575214
88.5	0.643968024881051196
88.6	0.643586041636255316
88.7	0.643205568774841584
88.8	0.642826600073535528
88.9	0.642449129339921605
89.0	0.642073150412232309
89.1	0.641698657159138961
89.2	0.641325643479544169
89.3	0.640954103302375928
89.4	0.640584030586383373
89.5	0.640215419319934140
89.6	0.639848263520813341
89.7	0.639482557236024125
89.8	0.639118294541589823
89.9	0.638755469542357653
90.0	0.638394076371803976
90.1	0.638034109191841080
90.2	0.637675562192625500
90.3	0.637318429592367832
90.4	0.636962705637144046
90.5	0.636608384600708282
90.6	0.636255460784307112
90.7	0.635903928516495255
90.8	0.635553782152952733
90.9	0.635205016076303462
91.0	0.634857624695935248
91.1	0.634511602447821197
91.2	0.634166943794342507
91.3	0.633823643224112646
91.4	0.633481695251802892
91.5	0.633141094417969226
91.6	0.632801835288880572
91.7	0.632463912456348361
91.8	0.632127320537557422
91.9	0.631792054174898173
92.0	0.631458108035800111
92.1	0.631125476812566584
92.2	0.630794155222210842
92.3	0.630464138006293339
92.4	0.630135419930760299
92.5	0.629807995785783514

92.6	0.629481860385601372
92.7	0.629157008568361103
92.8	0.628833435195962241
92.9	0.628511135153901271
93.0	0.628190103351117474
93.1	0.627870334719839944
93.2	0.627551824215435771
93.3	0.627234566816259384
93.4	0.626918557523503039
93.5	0.626603791361048448
93.6	0.626290263375319526
93.7	0.625977968635136267
93.8	0.625666902231569719
93.9	0.625357059277798066
94.0	0.625048434908963792
94.1	0.624741024282031927
94.2	0.624434822575649371
94.3	0.624129824990005266
94.4	0.623826026746692438
94.5	0.623523423088569864
94.6	0.623222009279626195
94.7	0.622921780604844286
94.8	0.622622732370066756
94.9	0.622324859901862555
95.0	0.622028158547394531
95.1	0.621732623674287984
95.2	0.621438250670500219
95.3	0.621145034944191055
95.4	0.620852971923594321
95.5	0.620562057056890298
95.6	0.620272285812079121
95.7	0.619983653676855118
95.8	0.619696156158482095
95.9	0.619409788783669539
96.0	0.619124547098449746
96.1	0.61884042668055865
96.2	0.618557423076800845
96.3	0.618275531927957277
96.4	0.617994748843638134
96.5	0.617715069464678386
96.6	0.617436489450517501
96.7	0.617159004479082807
96.8	0.616882610246673717
96.9	0.616607302467846819
97.0	0.616333076875301795
97.1	0.616059929219768203
97.2	0.615787855269893077
97.3	0.615516850812129360
97.4	0.615246911650625165
97.5	0.614978033607113833
97.6	0.614710212520804823
97.7	0.614443444248275378
97.8	0.614177724663363005
97.9	0.613913049657058736
98.0	0.613649415137401167
98.1	0.613386817029371283
98.2	0.613125251274788046
98.3	0.612864713832204746
98.4	0.612605200676806113
98.5	0.612346707800306179
98.6	0.612089231210846888
98.7	0.611832766932897440
98.8	0.611577311007154376

98.9	0.611322859490442383
99.0	0.611069408455615831
99.1	0.610816953991461021
99.2	0.610565492202599138
99.3	0.610315019209389928
99.4	0.610065531147836052
99.5	0.609817024169488151
99.6	0.609569494441350596
99.7	0.609322938145787918
99.8	0.609077351480431920
99.9	0.608832730658089459
100.0	0.608589071906650904
100.1	0.608346371468999244
100.2	0.608104625602919866
100.3	0.607863830581010976
100.4	0.607623982690594675
100.5	0.607385078233628674
100.6	0.607147113526618645
100.7	0.606910084900531209
100.8	0.606673988700707549
100.9	0.606438821286777649
101.0	0.606204579032575146
101.1	0.605971258326052802
101.2	0.605738855569198582
101.3	0.605507367177952335
101.4	0.605276789582123081
101.5	0.605047119225306882
101.6	0.604818352564805319
101.7	0.604590486071544540
101.8	0.604363516229994904
101.9	0.604137439538091190
102.0	0.603912252507153389
102.1	0.603687951661808060
102.2	0.603464533539910251
102.3	0.603241994692465987
102.4	0.603020331683555301
102.5	0.602799541090255831
102.6	0.602579619502566958
102.7	0.602360563523334490
102.8	0.602142369768175883
102.9	0.601925034865406006
103.0	0.601708555455963428
103.1	0.601492928193337242
103.2	0.601278149743494406
103.3	0.601064216784807613
103.4	0.600851126007983668
103.5	0.600638874115992384
103.6	0.600427457823995990
103.7	0.600216873859279035
103.8	0.600007118961178803
103.9	0.599798189881016220
104.0	0.599590083382027264
104.1	0.599382796239294851
104.2	0.599176325239681226
104.3	0.598970667181760826
104.4	0.598765818875753626
104.5	0.598561777143458966
104.6	0.598358538818189850
104.7	0.598156100744707708
104.8	0.597954459779157637
104.9	0.597753612789004097
105.0	0.597553556652967071
105.1	0.597354288260958679

105.2	0.597155804514020250
105.3	0.596958102324259839
105.4	0.596761178614790198
105.5	0.596565030319667184
105.6	0.596369654383828616
105.7	0.596175047763033564
105.8	0.595981207423802070
105.9	0.595788130343355315
106.0	0.595595813509556197
106.1	0.595404253920850348
106.2	0.595213448586207567
106.3	0.595023394525063676
106.4	0.594834088767262793
106.5	0.594645528353000016
106.6	0.594457710332764524
106.7	0.594270631767283080
106.8	0.594084289727463944
106.9	0.593898681294341188
107.0	0.593713803559019409
107.1	0.593529653622618846
107.2	0.593346228596220879
107.3	0.593163525600813934
107.4	0.592981541767239769
107.5	0.592800274236140146
107.6	0.592619720157903895
107.7	0.592439876692614348
107.8	0.592260741009997162
107.9	0.592082310289368511
108.0	0.591904581719583657
108.1	0.591727552498985891
108.2	0.591551219835355836
108.3	0.591375580945861128
108.4	0.591200633057006453
108.5	0.591026373404583946
108.6	0.590852799233623948
108.7	0.590679907798346128
108.8	0.590507696362110946
108.9	0.590336162197371479
109.0	0.590165302585625591
109.1	0.589995114817368448
109.2	0.589825596192045389
109.3	0.589656744018005123
109.4	0.589488555612453282
109.5	0.589321028301406302
109.6	0.589154159419645647
109.7	0.588987946310672358
109.8	0.588822386326661942
109.9	0.588657476828419588
110.0	0.588493215185335709
110.1	0.588329598775341807
110.2	0.588166624984866669
110.3	0.588004291208792872
110.4	0.587842594850413619
110.5	0.587681533321389886
110.6	0.587521104041707881
110.7	0.587361304439636822
110.8	0.587202131951687020
110.9	0.587043584022568279
111.0	0.586885658105148590
111.1	0.586728351660413145
111.2	0.586571662157423639
111.3	0.586415587073277887
111.4	0.586260123893069727

111.5	0.586105270109849233
111.6	0.585951023224583211
111.7	0.585797380746115999
111.8	0.585644340191130551
111.9	0.585491899084109816
112.0	0.585340054957298400
112.1	0.585188805350664522
112.2	0.585038147811862242
112.3	0.584888079896193988
112.4	0.584738599166573346
112.5	0.584589703193488144
112.6	0.584441389554963804
112.7	0.584293655836526978
112.8	0.584146499631169446
112.9	0.583999918539312298
113.0	0.583853910168770380
113.1	0.583708472134717014
113.2	0.583563602059648977
113.3	0.583419297573351756
113.4	0.583275556312865055
113.5	0.583132375922448582
113.6	0.582989754053548073
113.7	0.582847688364761599
113.8	0.582706176521806114
113.9	0.582565216197484267
114.0	0.582424805071651468
114.1	0.582284940831183201
114.2	0.582145621169942599
114.3	0.582006843788748257
114.4	0.581868606395342305
114.5	0.581730906704358718
114.6	0.581593742437291880
114.7	0.581457111322465385
114.8	0.581321011095001084
114.9	0.581185439496788373
115.0	0.581050394276453723
115.1	0.580915873189330442
115.2	0.580781873997428677
115.3	0.580648394469405657
115.4	0.580515432380536160
115.5	0.580382985512683220
115.6	0.580251051654269064
115.7	0.580119628600246275
115.8	0.579988714152069188
115.9	0.579858306117665515
116.0	0.579728402311408187
116.1	0.579599000554087431
116.2	0.579470098672883063
116.3	0.579341694501337009
116.4	0.579213785879326040
116.5	0.579086370653034730
116.6	0.578959446674928634
116.7	0.578833011803727682
116.8	0.578707063904379782
116.9	0.578581600848034649
117.0	0.578456620512017838
117.1	0.578332120779804993
117.2	0.578208099540996305
117.3	0.578084554691291181
117.4	0.577961484132463118
117.5	0.577838885772334793
117.6	0.577716757524753345
117.7	0.577595097309565873

117.8	0.577473903052595137
117.9	0.577353172685615450
118.0	0.577232904146328788
118.1	0.577113095378341088
118.2	0.576993744331138750
118.3	0.576874848960065332
118.4	0.576756407226298452
118.5	0.576638417096826872
118.6	0.576520876544427789
118.7	0.576403783547644312
118.8	0.576287136090763134
118.9	0.576170932163792390
119.0	0.576055169762439720
119.1	0.575939846888090502
119.2	0.575824961547786285
119.3	0.575710511754203407
119.4	0.575596495525631798
119.5	0.575482910885953968
119.6	0.575369755864624177
119.7	0.575257028496647794
119.8	0.575144726822560830
119.9	0.575032848888409658
120.0	0.574921392745730910
120.1	0.574810356451531553
120.2	0.574699738068269143
120.3	0.574589535663832259
120.4	0.574479747311521106
120.5	0.574370371090028300
120.6	0.574261405083419825
120.7	0.57415284738116158
120.8	0.574044696077873574
120.9	0.573936949273765618
121.0	0.573829605074164747
121.1	0.573722661589724139
121.2	0.573616116936359680
121.3	0.573509969235232105
121.4	0.573404216612729315
121.5	0.573298857200448857
121.6	0.573193889135180567
121.7	0.573089310558889380
121.8	0.572985119618698301
121.9	0.572881314466871534
122.0	0.572777893260797784
122.1	0.572674854162973702
122.2	0.572572195340987508
122.3	0.572469914967502756
122.4	0.572368011220242270
122.5	0.572266482281972226
122.6	0.572165326340486397
122.7	0.572064541588590552
122.8	0.571964126224087004
122.9	0.571864078449759321
123.0	0.571764396473357179
123.1	0.571665078507581377
123.2	0.571566122770068993
123.3	0.571467527483378696
123.4	0.571369290874976210
123.5	0.571271411177219919
123.6	0.571173886627346623
123.7	0.571076715467457445
123.8	0.570979895944503877
123.9	0.570883426310273978
124.0	0.570787304821378709

124.1	0.570691529739238423
124.2	0.570596099330069481
124.3	0.570501011864871033
124.4	0.570406265619411915
124.5	0.570311858874217710
124.6	0.570217789914557931
124.7	0.570124057030433356
124.8	0.570030658516563492
124.9	0.569937592672374182
125.0	0.569844857801985350
125.1	0.569752452214198875
125.2	0.569660374222486610
125.3	0.569568622144978529
125.4	0.569477194304451007
125.5	0.569386089028315243
125.6	0.569295304648605804
125.7	0.569204839501969305
125.8	0.569114691929653225
125.9	0.569024860277494845
126.0	0.568935342895910323
126.1	0.568846138139883894
126.2	0.568757244368957198
126.3	0.568668659947218739
126.4	0.568580383243293467
126.5	0.568492412630332490
126.6	0.568404746486002907
126.7	0.568317383192477773
126.8	0.568230321136426178
126.9	0.568143558709003460
127.0	0.568057094305841534
127.1	0.567970926327039345
127.2	0.567885053177153445
127.3	0.567799473265188686
127.4	0.567714185004589038
127.5	0.567629186813228522
127.6	0.567544477113402269
127.7	0.567460054331817687
127.8	0.567375916899585755
127.9	0.567292063252212430
128.0	0.567208491829590167
128.1	0.567125201075989562
128.2	0.567042189440051107
128.3	0.566959455374777052
128.4	0.566876997337523396
128.5	0.566794813789991977
128.6	0.566712903198222681
128.7	0.566631264032585763
128.8	0.566549894767774278
128.9	0.566468793882796622
129.0	0.566387959860969187
129.1	0.566307391189909116
129.2	0.566227086361527183
129.3	0.566147043872020760
129.4	0.566067262221866915
129.5	0.565987739915815596
129.6	0.565908475462882934
129.7	0.565829467376344650
129.8	0.565750714173729562
129.9	0.565672214376813205
130.0	0.565593966511611547
130.1	0.565515969108374811
130.2	0.565438220701581404
130.3	0.565360719829931943



130.4	0.565283465036343387
130.5	0.565206454867943263
130.6	0.565129687876064004
130.7	0.565053162616237375
130.8	0.564976877648189006
130.9	0.564900831535833023
131.0	0.564825022847266775
131.1	0.564749450154765658
131.2	0.564674112034778042
131.3	0.564599007067920284
131.4	0.564524133838971854
131.5	0.564449490936870533
131.6	0.564375076954707731
131.7	0.564300890489723878
131.8	0.564226930143303925
131.9	0.564153194520972927
132.0	0.564079682232391725
132.1	0.564006391891352719
132.2	0.563933322115775729
132.3	0.563860471527703955
132.4	0.563787838753300016
132.5	0.563715422422842092
132.6	0.563643221170720146
132.7	0.563571233635432237
132.8	0.563499458459580924
132.9	0.563427894289869758
133.0	0.563356539777099854
133.1	0.563285393576166563
133.2	0.563214454346056217
133.3	0.563143720749842966
133.4	0.563073191454685703
133.5	0.563002865131825068
133.6	0.562932740456580539
133.7	0.562862816108347606
133.8	0.562793090770595030
133.9	0.562723563130862182
134.0	0.562654231880756464
134.1	0.562585095715950814
134.2	0.562516153336181295
134.3	0.562447403445244751
134.4	0.562378844750996563
134.5	0.562310475965348467
134.6	0.562242295804266462
134.7	0.562174302987768793
134.8	0.562106496239924009
134.9	0.562038874288849103
135.0	0.561971435866707731
135.1	0.561904179709708498
135.2	0.561837104558103330
135.3	0.561770209156185920
135.4	0.561703492252290240
135.5	0.561636952598789142
135.6	0.561570588952093019
135.7	0.561504400072648554
135.8	0.561438384724937527
135.9	0.561372541677475703
136.0	0.561306869702811796
136.1	0.561241367577526497
136.2	0.561176034082231574
136.3	0.561110868001569046
136.4	0.561045868124210427
136.5	0.560981033242856039
136.6	0.560916362154234389

136.7	0.560851853659101629
136.8	0.560787506562241064
136.9	0.560723319672462747
137.0	0.560659291802603129
137.1	0.560595421769524782
137.2	0.560531708394116184
137.3	0.560468150501291576
137.4	0.560404746919990877
137.5	0.560341496483179671
137.6	0.560278398027849252
137.7	0.560215450395016741
137.8	0.560152652429725256
137.9	0.560090002981044158
138.0	0.560027500902069346
138.1	0.559965145049923628
138.2	0.559902934285757139
138.3	0.559840867474747835
138.4	0.559778943486102038
138.5	0.559717161193055043
138.6	0.559655519472871790
138.7	0.559594017206847587
138.8	0.559532653280308900
138.9	0.559471426582614198
139.0	0.559410336007154854
139.1	0.559349380451356111
139.2	0.559288558816678093
139.3	0.559227870008616886
139.4	0.559167312936705668
139.5	0.559106886514515895
139.6	0.559046589659658544
139.7	0.558986421293785409
139.8	0.558926380342590457
139.9	0.558866465735811232
140.0	0.558806676407230314
140.1	0.558747011294676832
140.2	0.558687469340028032
140.3	0.558628049489210895
140.4	0.558568750692203803
140.5	0.558509571903038265
140.6	0.558450512079800688
140.7	0.558391570184634200
140.8	0.558332745183740523
140.9	0.558274036047381897
141.0	0.558215441749883050
141.1	0.558156961269633222
141.2	0.558098593589088234
141.3	0.558040337694772603
141.4	0.557982192577281710
141.5	0.557924157231284011
141.6	0.557866230655523296
141.7	0.557808411852820996
141.8	0.557750699830078531
141.9	0.557693093598279709
142.0	0.557635592172493169
142.1	0.557578194571874862
142.2	0.557520899819670588
142.3	0.557463706943218564
142.4	0.557406614973952049
142.5	0.557349622947401997
142.6	0.557292729903199764
142.7	0.557235934885079854
142.8	0.557179236940882702
142.9	0.557122635122557509

143.0	0.557066128486165101
143.1	0.557009716091880849
143.2	0.556953397003997613
143.3	0.556897170290928729
143.4	0.556841035025211046
143.5	0.556784990283507982
143.6	0.556729035146612640
143.7	0.556673168699450946
143.8	0.556617390031084832
143.9	0.556561698234715453
144.0	0.556506092407686446
144.1	0.556450571651487218
144.2	0.556395135071756278
144.3	0.556339781778284594
144.4	0.556284510885019001
144.5	0.556229321510065626
144.6	0.556174212775693359
144.7	0.556119183808337357
144.8	0.556064233738602580
144.9	0.556009361701267354
145.0	0.555954566835286981
145.1	0.555899848283797366
145.2	0.555845205194118689
145.3	0.555790636717759101
145.4	0.555736142010418452
145.5	0.555681720231992054
145.6	0.555627370546574471
145.7	0.555573092122463338
145.8	0.555518884132163216
145.9	0.555464745752389468
146.0	0.555410676164072174
146.1	0.555356674552360062
146.2	0.555302740106624479
146.3	0.555248872020463384
146.4	0.555195069491705372
146.5	0.555141331722413718
146.6	0.555087657918890455
146.7	0.555034047291680480
146.8	0.554980499055575675
146.9	0.554927012429619066
147.0	0.554873586637109001
147.1	0.554820220905603352
147.2	0.554766914466923749
147.3	0.554713666557159824
147.4	0.554660476416673497
147.5	0.554607343290103271
147.6	0.554554266426368556
147.7	0.554501245078674016
147.8	0.554448278504513937
147.9	0.554395365965676619
148.0	0.554342506728248785
148.1	0.554289700062620018
148.2	0.554236945243487214
148.3	0.554184241549859060
148.4	0.554131588265060525
148.5	0.554078984676737377
148.6	0.554026430076860724
148.7	0.553973923761731559
148.8	0.553921465031985341
148.9	0.553869053192596583
149.0	0.553816687552883462
149.1	0.553764367426512452
149.2	0.553712092131502964

149.3	0.553659860990232010
149.4	0.553607673329438885
149.5	0.55355528480229863
149.6	0.553503425778082907
149.7	0.553451364562852400
149.8	0.553399344178773889
149.9	0.553347363974468842
150.0	0.553295423302949424
150.1	0.553243521521623287
150.2	0.553191657992298367
150.3	0.553139832081187710
150.4	0.553088043158914296
150.5	0.553036290600515884
150.6	0.552984573785449870
150.7	0.552932892097598155
150.8	0.552881244925272030
150.9	0.552829631661217066
151.0	0.552778051702618022
151.1	0.552726504451103760
151.2	0.552674989312752175
151.3	0.552623505698095134
151.4	0.552572053022123424
151.5	0.552520630704291713
151.6	0.552469238168523517
151.7	0.552417874843216183
151.8	0.552366540161245875
151.9	0.552315233559972570
152.0	0.552263954481245067
152.1	0.552212702371406001
152.2	0.552161476681296863
152.3	0.552110276866263033
152.4	0.552059102386158818
152.5	0.552007952705352496
152.6	0.551956827292731369
152.7	0.551905725621706820
152.8	0.551854647170219382
152.9	0.551803591420743807
153.0	0.551752557860294142
153.1	0.551701545980428816
153.2	0.551650555277255724
153.3	0.551599585251437321
153.4	0.551548635408195723
153.5	0.551497705257317807
153.6	0.551446794313160316
153.7	0.551395902094654973
153.8	0.551345028125313594
153.9	0.551294171933233206
154.0	0.551243333051101167
154.1	0.551192511016200291
154.2	0.551141705370413974
154.3	0.551090915660231324
154.4	0.551040141436752290
154.5	0.550989382255692798
154.6	0.550938637677389884
154.7	0.550887907266806829
154.8	0.550837190593538300
154.9	0.550786487231815485
155.0	0.550735796760511234
155.1	0.550685118763145198
155.2	0.550634452827888967
155.3	0.550583798547571215
155.4	0.550533155519682832
155.5	0.550482523346382071

155.6	0.550431901634499679
155.7	0.550381289995544042
155.8	0.550330688045706315
155.9	0.550280095405865561
156.0	0.550229511701593885
156.1	0.550178936563161561
156.2	0.550128369625542168
156.3	0.550077810528417714
156.4	0.550027258916183762
156.5	0.549976714437954553
156.6	0.549926176747568126
156.7	0.549875645503591435
156.8	0.549825120369325461
156.9	0.549774601012810325
157.0	0.549724087106830392
157.1	0.549673578328919376
157.2	0.549623074361365439
157.3	0.549572574891216284
157.4	0.549522079610284248
157.5	0.549471588215151383
157.6	0.549421100407174546
157.7	0.549370615892490464
157.8	0.549320134382020818
157.9	0.549269655591477296
158.0	0.549219179241366666
158.1	0.549168705056995822
158.2	0.549118232768476838
158.3	0.549067762110732011
158.4	0.549017292823498895
158.5	0.548966824651335340
158.6	0.548916357343624508
158.7	0.548865890654579899
158.8	0.548815424343250356
158.9	0.548764958173525078
159.0	0.548714491914138609
159.1	0.548664025338675836
159.2	0.548613558225576971
159.3	0.548563090358142524
159.4	0.548512621524538276
159.5	0.548462151517800241
159.6	0.548411680135839613
159.7	0.548361207181447720
159.8	0.548310732462300955
159.9	0.548260255790965709
160.0	0.548209776984903293
160.1	0.548159295866474848
160.2	0.548108812262946250
160.3	0.548058326006493010
160.4	0.548007836934205155
160.5	0.547957344888092111
160.6	0.547906849715087572
160.7	0.547856351267054358
160.8	0.547805849400789271
160.9	0.547755343978027932
161.0	0.547704834865449619
161.1	0.547654321934682088
161.2	0.547603805062306389
161.3	0.547553284129861670
161.4	0.547502759023849971
161.5	0.547452229635741015
161.6	0.547401695861976975
161.7	0.547351157603977251
161.8	0.547300614768143216

161.9	0.547250067265862971
162.0	0.547199515013516076
162.1	0.547148957932478279
162.2	0.547098395949126230
162.3	0.547047828994842192
162.4	0.546997257006018732
162.5	0.546946679924063409
162.6	0.546896097695403450
162.7	0.546845510271490414
162.8	0.546794917608804852
162.9	0.546744319668860941
163.0	0.546693716418211130
163.1	0.546643107828450757
163.2	0.546592493876222666
163.3	0.546541874543221804
163.4	0.546491249816199823
163.5	0.546440619686969654
163.6	0.546389984152410082
163.7	0.546339343214470306
163.8	0.546288696880174492
163.9	0.546238045161626309
164.0	0.546187388076013463
164.1	0.546136725645612213
164.2	0.546086057897791883
164.3	0.546035384865019355
164.4	0.545984706584863563
164.5	0.545934023099999965
164.6	0.545883334458215017
164.7	0.545832640712410620
164.8	0.545781941920608575
164.9	0.545731238145955016
165.0	0.545680529456724835
165.1	0.545629815926326098
165.2	0.545579097633304453
165.3	0.545528374661347521
165.4	0.545477647099289286
165.5	0.545426915041114468
165.6	0.545376178585962886
165.7	0.545325437838133820
165.8	0.545274692907090351
165.9	0.545223943907463699
166.0	0.545173190959057551
166.1	0.545122434186852373
166.2	0.545071673721009724
166.3	0.545020909696876548
166.4	0.544970142254989464
166.5	0.544919371541079050
166.6	0.544868597706074106
166.7	0.544817820906105918
166.8	0.544767041302512513
166.9	0.544716259061842897
167.0	0.544665474355861294
167.1	0.544614687361551371
167.2	0.544563898261120452
167.3	0.544513107242003735
167.4	0.544462314496868482
167.5	0.544411520223618222
167.6	0.544360724625396929
167.7	0.544309927910593204
167.8	0.544259130292844439
167.9	0.544208331991040982
168.0	0.544157533229330291
168.1	0.544106734237121082

168.2	0.544055935249087463
168.3	0.544005136505173078
168.4	0.543954338250595220
168.5	0.543903540735848962
168.6	0.543852744216711263
168.7	0.543801948954245079
168.8	0.543751155214803457
168.9	0.543700363270033643
169.0	0.543649573396881155
169.1	0.543598785877593880
169.2	0.543548000999726143
169.3	0.543497219056142788
169.4	0.543446440345023238
169.5	0.543395665169865567
169.6	0.543344893839490550
169.7	0.543294126668045728
169.8	0.543243363975009448
169.9	0.543192606085194919
170.0	0.543141853328754248
170.1	0.543091106041182484
170.2	0.543040364563321655
170.3	0.542989629241364797
170.4	0.542938900426859991
170.5	0.542888178476714387
170.6	0.542837463753198233
170.7	0.542786756623948899
170.8	0.542736057461974897
170.9	0.542685366645659910
171.0	0.542634684558766802
171.1	0.542584011590441647
171.2	0.542533348135217740
171.3	0.542482694593019624
171.4	0.542432051369167100
171.5	0.542381418874379251
171.6	0.542330797524778461
171.7	0.542280187741894437
171.8	0.542229589952668223
171.9	0.542179004589456234
172.0	0.542128432090034273
172.1	0.542077872897601558
172.2	0.542027327460784759
172.3	0.541976796233642022
172.4	0.541926279675667006
172.5	0.541875778251792924
172.6	0.541825292432396587
172.7	0.541774822693302445
172.8	0.541724369515786641
172.9	0.541673933386581070
173.0	0.541623514797877435
173.1	0.541573114247331314
173.2	0.541522732238066238
173.3	0.541472369278677762
173.4	0.541422025883237557
173.5	0.541371702571297498
173.6	0.541321399867893765
173.7	0.541271118303550953
173.8	0.541220858414286181
173.9	0.541170620741613227
174.0	0.541120405832546651
174.1	0.541070214239605942
174.2	0.541020046520819671
174.3	0.540969903239729654
174.4	0.540919784965395123

174.5	0.540869692272396911
174.6	0.540819625740841651
174.7	0.540769585956365979
174.8	0.540719573510140756
174.9	0.540669588998875303
175.0	0.540619633024821646
175.1	0.540569706195778772
175.2	0.540519809125096910
175.3	0.540469942431681814
175.4	0.540420106739999070
175.5	0.540370302680078414
175.6	0.540320530887518067
175.7	0.540270792003489088
175.8	0.540221086674739744
175.9	0.540171415553599894
176.0	0.540121779297985390
176.1	0.540072178571402513
176.2	0.540022614042952400
176.3	0.539973086387335515
176.4	0.539923596284856124
176.5	0.539874144421426805
176.6	0.539824731488572963
176.7	0.539775358183437382
176.8	0.539726025208784787
176.9	0.539676733273006434
177.0	0.539627483090124728
177.1	0.539578275379797853
177.2	0.539529110867324437
177.3	0.539479990283648241
177.4	0.539430914365362862
177.5	0.539381883854716477
177.6	0.539332899499616609
177.7	0.539283962053634912
177.8	0.539235072276011997
177.9	0.539186230931662274
178.0	0.539137438791178832
178.1	0.539088696630838347
178.2	0.539040005232606015
178.3	0.538991365384140521
178.4	0.538942777878799039
178.5	0.538894243515642261
178.6	0.538845763099439462
178.7	0.538797337440673599
178.8	0.538748967355546437
178.9	0.538700653665983722
179.0	0.538652397199640374
179.1	0.538604198789905732
179.2	0.538556059275908823
179.3	0.538507979502523671
179.4	0.538459960320374654
179.5	0.538412002585841883
179.6	0.538364107161066634
179.7	0.538316274913956815
179.8	0.538268506718192470
179.9	0.538220803453231335
180.0	0.538173166004314420
180.1	0.538125595262471652
180.2	0.538078092124527549
180.3	0.538030657493106942
180.4	0.537983292276640742
180.5	0.537935997389371756
180.6	0.537888773751360542
180.7	0.537841622288491320



180.8	0.537794543932477923
180.9	0.537747539620869804
181.0	0.537700610297058087
181.1	0.537653756910281674
181.2	0.537606980415633393
181.3	0.537560281774066212
181.4	0.537513661952399495
181.5	0.537467121923325314
181.6	0.537420662665414816
181.7	0.537374285163124650
181.8	0.537327990406803437
181.9	0.537281779392698314
182.0	0.537235653122961519
182.1	0.537189612605657046
182.2	0.537143658854767355
182.3	0.537097792890200141
182.4	0.537052015737795167
182.5	0.537006328429331154
182.6	0.536960732002532742
182.7	0.536915227501077506
182.8	0.536869815974603038
182.9	0.536824498478714101
183.0	0.536779276074989843
183.1	0.536734149830991077
183.2	0.536689120820267635
183.3	0.536644190122365785
183.4	0.536599358822835724
183.5	0.536554628013239135
183.6	0.536509998791156819
183.7	0.536465472260196404
183.8	0.536421049530000119
183.9	0.536376731716252648
184.0	0.536332519940689060
184.1	0.536288415331102815
184.2	0.536244419021353842
184.3	0.536200532151376704
184.4	0.536156755867188839
184.5	0.536113091320898878
184.6	0.536069539670715051
184.7	0.536026102080953668
184.8	0.535982779722047691
184.9	0.535939573770555386
185.0	0.535896485409169060
185.1	0.535853515826723890
185.2	0.535810666218206830
185.3	0.535767937784765620
185.4	0.535725331733717869
185.5	0.535682849278560248
185.6	0.535640491638977752
185.7	0.535598260040853076
185.8	0.535556155716276072
185.9	0.535514179903553309
186.0	0.535472333847217722
186.1	0.535430618798038363
186.2	0.535389036013030255
186.3	0.535347586755464331
186.4	0.535306272294877495
186.5	0.535265093907082762
186.6	0.535224052874179521
186.7	0.535183150484563889
186.8	0.535142388032939179
186.9	0.535101766820326468
187.0	0.535061288154075277

187.1	0.535020953347874361
187.2	0.534980763721762604
187.3	0.534940720602140030
187.4	0.534900825321778928
187.5	0.534861079219835085
187.6	0.534821483641859140
187.7	0.534782039939808050
187.8	0.534742749472056679
187.9	0.534703613603409499
188.0	0.534664633705112422
188.1	0.534625811154864736
188.2	0.534587147336831186
188.3	0.534548643641654160
188.4	0.534510301466466009
188.5	0.534472122214901499
188.6	0.534434107297110377
188.7	0.534396258129770082
188.8	0.534358576136098573
188.9	0.534321062745867301
189.0	0.534283719395414306
189.1	0.534246547527657453
189.2	0.534209548592107806
189.3	0.534172724044883133
189.4	0.534136075348721560
189.5	0.534099603972995353
189.6	0.534063311393724855
189.7	0.534027199093592560
189.8	0.533991268561957331
189.9	0.533955521294868763
190.0	0.533919958795081703
190.1	0.533884582572070910
190.2	0.533849394142045869
190.3	0.533814395027965757
190.4	0.533779586759554564
190.5	0.533744970873316366
190.6	0.533710548912550764
190.7	0.533676322427368469
190.8	0.533642292974707052
190.9	0.533608462118346864
191.0	0.533574831428927104
191.1	0.533541402483962066
191.2	0.533508176867857542
191.3	0.533475156171927396
191.4	0.533442341994410316
191.5	0.533409735940486722
191.6	0.533377339622295859
191.7	0.533345154658953063
191.8	0.533313182676567191
191.9	0.533281425308258256
192.0	0.533249884194175207
192.1	0.533218560981513919
192.2	0.533187457324535354
192.3	0.533156574884583905
192.4	0.533125915330105930
192.5	0.533095480336668478
192.6	0.533065271586978199
192.7	0.533035290770900450
192.8	0.533005539585478588
192.9	0.532976019734953472
193.0	0.532946732930783148
193.1	0.532917680891662743
193.2	0.532888865343544556
193.3	0.532860288019658354

193.4	0.532831950660531867
193.5	0.532803855014011502
193.6	0.532776002835283254
193.7	0.532748395886893832
193.8	0.532721035938772000
193.9	0.532693924768250130
194.0	0.532667064160085970
194.1	0.532640455906484634
194.2	0.532614101807120812
194.3	0.532588003669161203
194.4	0.532562163307287166
194.5	0.532536582543717610
194.6	0.532511263208232100
194.7	0.532486207138194206
194.8	0.532461416178575075
194.9	0.532436892181977240
195.0	0.532412637008658674
195.1	0.532388652526557075
195.2	0.532364940611314390
195.3	0.532341503146301598
195.4	0.532318342022643722
195.5	0.532295459139245094
195.6	0.532272856402814881
195.7	0.532250535727892847
195.8	0.532228499036875380
195.9	0.532206748260041779
196.0	0.532185285335580790
196.1	0.532164112209617410
196.2	0.532143230836239958
196.3	0.532122643177527411
196.4	0.532102351203577000
196.5	0.532082356892532092
196.6	0.532062662230610333
196.7	0.532043269212132078
196.8	0.532024179839549092
196.9	0.532005396123473534
197.0	0.531986920082707226
197.1	0.531968753744271207
197.2	0.531950899143435580
197.3	0.531933358323749639
197.4	0.531916133337072304
197.5	0.531899226243602845
197.6	0.531882639111911902
197.7	0.531866374018972817
197.8	0.531850433050193258
197.9	0.531834818299447161
198.0	0.531819531869106975
198.1	0.531804575870076222
198.2	0.531789952421822375
198.3	0.531775663652410045
198.4	0.531761711698534501
198.5	0.531748098705555507
198.6	0.531734826827531483
198.7	0.531721898227254002
198.8	0.531709315076282618
198.9	0.531697079554980023
199.0	0.531685193852547551
199.1	0.531673660167061016
199.2	0.531662480705506902
199.3	0.531651657683818891
199.4	0.531641193326914748
199.5	0.531631089868733559
199.6	0.531621349552273318

199.7	0.531611974629628889
199.8	0.531602967362030312
199.9	0.531594330019881491
200.0	0.531586064882799239
200.1	0.531578174239652705
200.2	0.531570660388603172
200.3	0.531563525637144231
200.4	0.531556772302142347
200.5	0.531550402709877796
200.6	0.531544419196086011
200.7	0.531538824105999297
200.8	0.531533619794388961
200.9	0.531528808625607833
201.0	0.531524392973633192
201.1	0.531520375222110093
201.2	0.531516757764395117
201.3	0.531513543003600516
201.4	0.531510733352638795
201.5	0.531508331234267698
201.6	0.531506339081135630
201.7	0.531504759335827503
201.8	0.531503594450911012
201.9	0.531502846888983349
202.0	0.531502519122718360
202.1	0.531502613634914140
202.2	0.531503132918541079
202.3	0.531504079476790356
202.4	0.531505455823122893
202.5	0.531507264481318767
202.6	0.531509507985527081
202.7	0.531512188880316307
202.8	0.531515309720725104
202.9	0.531518873072313600
203.0	0.531522881511215167
203.1	0.531527337624188674
203.2	0.531532244008671226
203.3	0.531537603272831404
203.4	0.531543418035622992
203.5	0.531549690926839214
203.6	0.531556424587167473
203.7	0.531563621668244602
203.8	0.531571284832712627
203.9	0.531579416754275055
204.0	0.531588020117753679
204.1	0.531597097619145921
204.2	0.531606651965682701
204.3	0.531616685875886844
204.4	0.531627202079632037
204.5	0.531638203318202329
204.6	0.531649692344352179
204.7	0.531661671922367076
204.8	0.531674144828124708
204.9	0.531687113849156699
205.0	0.531700581784710932
205.1	0.531714551445814437
205.2	0.531729025655336861
205.3	0.531744007248054544
205.4	0.531759499070715161
205.5	0.531775503982102986
205.6	0.531792024853104754
205.7	0.531809064566776123
205.8	0.531826626018408762
205.9	0.531844712115598061

