Corrections to NSM Advanced Exercises 20.4, 20.5 and Review 20 (Additional)

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Version 3: May 11, 2021 (with Exercise 20.4 Q10(c) and Q10(d) added)

First it should be said that the NSM notes (Aus & Fitzpatrick, 2020) are an important contribution to resources available for the new syllabus and I am glad that they have done it - despite the errors and inaccuracies explored in this article. Some schools last year used tables in their trials. Many university statistics courses also use tables - a good reason why their use in schools should be encouraged. There has been some speculation that NESA may at some time use them in HSC exams, although it didn't happen in last year's Advanced HSC exam. It doesn't mean they won't in the future. But use of these tables takes time, proper training and practice. It is not something that should come as a surprise in the final examination with no training whatsoever.

In this article I provide the following corrections to NSM Advanced Chapter 20 (Additional) Sections 20.4 and 20.5:

Examples 10, 16(d) and 17(c).

Exercise 20.4: Q4(a)(i), Q4(a)(iii), Q4(b)(iii), Q5, Q6(b), Q7(d), Q9, Q10

Exercise 20.5: Q5, Q6(b), Q12(a), Q12(b), Q13, Q14(g), Q16(b)

Chapter Review 20 (Additional) - henceforth referred to as CR20A: Q16(c), Q18, Q26(b)

There are some problems with adding or subtracting numbers from tables - values that have already been rounded to 4 decimal places for example. The result will not necessarily be correct to 4 decimal places. Many of the corrections here come from these problems.

Another inaccuracy is by trying to use a table backwards. With the normal distribution Tables A and B given in the notes used backwards is also sometimes inaccurate. As Table C is inadequate for most questions I have also provided 2 more tables which I call Table D and Table E. These are P to z tables where z is correct to 6 decimal places and respectively P is correct to 3 or 4 decimal places. This is far better than trying to use Tables A or B backwards.

Furthermore the error function or inverse error function can be used to get exact values of P or z respectively and then using wolframalpha.com to do the calculations - leading

to the most accurate solutions. Where

$$\operatorname{erf} z := \frac{2}{\sqrt{\pi}} \int_0^z e^{-t^2} \, dt$$

then $P := P(0 < z < z_1) = 0.5 \operatorname{erf}(\frac{z_1}{\sqrt{2}})$ and $z_1 = \sqrt{2} \operatorname{erf}^{-1}(2P)$

An alternative to the error function method is to use the CASIO fx-100AU PLUS 2nd edition calculator in Statistics Mode.

Press MODE 3 1 AC to put it into Statistics Mode and exit the Editor Screen.

Then press SHIFT 1 5 2 z_1) = to get $Q(z_1) := P(0 < z < z_1)$ for some positive z-score z_1.

Unfortunately the calculator doesn't have an inverse Q function but it can still be done by manipulating the z score sufficiently enough to get P as accurately as is desired up to 5 decimal places.

Example 10 $\mu = 17.3$ and $\sigma = \sqrt{30.4}$. The problems in this example and in Example 17(c) stem from rounding twice instead of only at the last step.

Example 10(a)
$$\begin{aligned}
P(X < 15) &= P\left(z < \tfrac{15-17.3}{\sqrt{30.4}}\right) \\
&= P\left(z < \tfrac{-2.3}{\sqrt{30.4}}\right) \\
&= 0.5 - P\left(0 < z < \tfrac{2.3}{\sqrt{30.4}}\right) \\
&= 0.5 - 0.5 \operatorname{erf}\left(\tfrac{2.3/\sqrt{30.4}}{\sqrt{2}}\right) \\
&= 0.5 - 0.5 \operatorname{erf}\left(\tfrac{2.3}{\sqrt{60.8}}\right) \\
&= 0.33828477\ldots \text{ using wolframalpha.com} \\
&\approx \color{red}{0.33828} \text{ not } 0.33724
\end{aligned}$$

Example 10(b)
$$\begin{aligned}
P(X > 15) &= P\left(z > \tfrac{-2.3}{\sqrt{30.4}}\right) \\
&= 0.5 + 0.5 \operatorname{erf}\left(\tfrac{2.3}{\sqrt{60.8}}\right) \\
&= 0.6617152298\ldots \\
&\approx \color{red}{0.66172} \text{ not } 0.66276
\end{aligned}$$

Example 10(c)
$$P(X < 25) = P\left(z < \frac{25 - 17.3}{\sqrt{30.4}}\right)$$
$$= P\left(z < \frac{7.7}{\sqrt{30.4}}\right)$$
$$= 0.5 + P\left(0 < z < \frac{7.7}{\sqrt{30.4}}\right)$$
$$= 0.5 + 0.5\operatorname{erf}\left(\frac{7.7/\sqrt{30.4}}{\sqrt{2}}\right)$$
$$= 0.5 + 0.5\operatorname{erf}\left(\frac{7.7}{\sqrt{60.8}}\right)$$
$$= 0.918724296\ldots$$
$$\approx 0.91872 \text{ not } 0.91924$$

Alternatively using the CASIO fx-100AU PLUS 2nd edition calculator in Statistics Mode, it is $0.5 + Q\left(\frac{7.7}{\sqrt{30.4}}\right) \approx 0.91872$ not 0.91924.

Example 10(d)
$$P(11.8 < X < 25) = P\left(\frac{11.8 - 17.3}{\sqrt{30.4}} < z < \frac{20 - 17.3}{\sqrt{30.4}}\right)$$
$$= P\left(\frac{-5.5}{\sqrt{30.4}} < z < \frac{2.7}{\sqrt{30.4}}\right)$$
$$= P\left(0 < z < \frac{5.5}{\sqrt{30.4}}\right) + P\left(0 < z < \frac{2.7}{\sqrt{30.4}}\right)$$
$$= 0.5\operatorname{erf}\left(\frac{5.5/\sqrt{30.4}}{\sqrt{2}}\right) + 0.5\operatorname{erf}\left(\frac{2.7/\sqrt{30.4}}{\sqrt{2}}\right)$$
$$= 0.5\operatorname{erf}\left(\frac{5.5}{\sqrt{60.8}}\right) + 0.5\operatorname{erf}\left(\frac{2.7}{\sqrt{60.8}}\right)$$
$$= 0.52857195\ldots$$
$$\approx 0.52857 \text{ not } 0.52928$$

Example 16(d) $P(-a < z < a) = 0.05$ so $P(0 < z < a) = 0.5 \times 0.05 = 0.025$ and Table D$\Rightarrow a = 0.062707 \approx 0.063$ not 1.960.

Alternatively $a = \sqrt{2}\operatorname{erf}^{-1}(2 \times 0.025) = 0.0627067779\cdots \approx 0.063$ not 1.960.

Example 17(c) $P(Z < k) = 0.3 = P(z < z_1), \mu = 2000\text{mm}$ and $\sigma = 200\text{mm}$.

Using Table A backwards,
$z_1 \approx -0.52 - \frac{15 \times 0.01}{3015 - 2981} = -\frac{1783}{3400}$ and $k \approx 2000 - 200 \times \frac{1783}{3400} \approx 1895\text{mm}$ not 1896mm.

This method of using a table backwards assumes it is linear, which it isn't. Hence this method can also lead to inaccuracies. It worked for this question but for others it will also give the incorrect answer.

The notes also use Table A backwards, but round $-\frac{1783}{3400}$ to -0.52 and then calculate $k = 2000 - 200 \times 0.52 \approx 1896$ which is incorrect. This is the problem with rounding twice instead of the last step only. In so doing they made the inaccuracies worse.

Using Table D and $P(0 < z < -z_1) = 0.5 - 0.3 = 0.2$, $z_1 = -0.524401$ and $k = 2000 - 200 \times 0.524401 \approx 1895\text{mm}$ not 1896mm.

Using the calculator,

$Q(0.5243) = 0.19996$
$Q(0.5244) = 0.2$
$Q(0.5245) = 0.20003$

Hence $z_1 \approx -0.5244$ and $k = 2000 - 200 \times 0.5244 \approx 1895\text{mm}$ not 1896mm.

Technically the Table D and calculator methods are also rounding twice, but values of z_1 given as -0.524401 and -0.5244 respectively are going to get you much closer to the true value of k than -0.52.

Ultimately the most accurate method is to use erf^{-1} to get the **exact** value of k and then only round off at the last step.

Using erf^{-1}, $z_1 = -\sqrt{2}\,\text{erf}^{-1}(2 \times 0.2)$ and

$k = 2000 - 200 \times \sqrt{2}\,\text{erf}^{-1}(0.4)$
$\quad = 1895.119897\ldots$
$\quad \approx 1895 \text{ mm}$ not 1896mm

20.4 Q4(a)(i) $P(z < 2) = 0.9772$ not 0.9972.

20.4 Q4(a)(iii) $P(-0.5 < z < 2) = 0.6687$ not 0.6887.

20.4 Q4(b)(iii) $P(z < 3) - P(z < 1) = P(0 < z < 3) - P(0 < z < 1)$
$$= 0.5\,\text{erf}\left(\tfrac{3}{\sqrt{2}}\right) - 0.5\,\text{erf}\left(\tfrac{1}{\sqrt{2}}\right)$$
$$= 0.157305355\ldots$$
$$\approx 0.1573 \text{ correct to 4 decimal places}$$

Alternatively using the CASIO fx-100AU PLUS 2nd edition calculator in Statistics Mode, it is $Q(3) - Q(1) \approx 0.15731 \approx 0.1573$.

However using Table B, $P(z < 3) - P(z < 1) \approx 0.9987 - 0.8413$
$$\approx 0.1574$$

Subtracting two rounded values gives the wrong answer 0.1574 which is **incorrect** to 4 decimal places, not **correct** to 4 decimal places. Some might say that it doesn't

matter because it is only approximate anyway. Then what is the point of being correct to 4 decimal places?

20.4 Q5 $P(z < 1.75) - P(z < -1.75) = 2P(0 < z < 1.75)$

$$= \mathrm{erf}\left(\tfrac{1.75}{\sqrt{2}}\right)$$

$$= 0.919881686\ldots$$

$$\approx 0.9199$$

Or with the calculator, $2Q(1.75) \approx 0.91988 \approx 0.9199$.

Using Tables B and A, $P(z < 1.75) - P(z < -1.75) \approx 0.9599 - 0.0401$

$$\approx 0.9198$$

Again 0.9199 is the more accurate answer.

20.4 Q6(b) $P(-1 < z < 1) = 2P(0 < z < 1)$

$$= \mathrm{erf}\left(\tfrac{1}{\sqrt{2}}\right)$$

$$\approx 0.6826894\ldots$$

$$\approx 0.6827$$

Using Tables B and A, $P(-1 < z < 1) = P(z < 1) - P(z < -1)$

$$\approx 0.8413 - 0.1587$$

$$\approx 0.6826$$

Again 0.6827 is more accurate.

20.4 Q7(d) $\mu = 1017\text{g}$, not 1010g, however the calculation $P(z < -1.7) \approx 0.0446$ is correct.

20.4 Q9(a) $P(-1 < z < 1) = 2P(0 < z < 1)$

$$= \mathrm{erf}\left(\tfrac{1}{\sqrt{2}}\right)$$

$$\approx 0.6826894\ldots$$

$$\approx 0.6827 \text{ not } 0.6826$$

20.4 Q9(b) $P(-2 < z < 2) = 2P(0 < z < 2)$

$$= \mathrm{erf}\left(\sqrt{2}\right)$$

$$\approx 0.9544997\ldots$$

$$\approx 0.9545 \text{ not } 0.9544$$

20.4 **Q9(c)** $P(-3 < z < 3) = 2P(0 < z < 3)$

$$= \mathrm{erf}\left(\tfrac{3}{\sqrt{2}}\right)$$

$$\approx 0.9973002\ldots$$

$$\approx 0.9973 \text{ not } 0.9974$$

20.4 **Q10(a)** $P\left(z \geq -\tfrac{20}{11}\right) = 0.5 + 0.5\,\mathrm{erf}\left(\tfrac{20}{11\sqrt{2}}\right)$

$$\approx 0.965481826\ldots$$

$$\approx 0.9655 \text{ not } 0.9656$$

20.4 **Q10(b)** $P\left(z < -\tfrac{25}{11}\right) = 0.5 - 0.5\,\mathrm{erf}\left(\tfrac{25}{11\sqrt{2}}\right)$

$$\approx 0.01152131004\ldots$$

$$\approx 0.0115 \text{ not } 0.0116$$

20.4 **Q10(c)** $P(A < a) = 0.9 \therefore P(0 < A < a) = 0.9 - 0.5 = 0.4.$ Using Table D, $z = 1.281552 \approx 1.28$ and $a = \lceil 1.281552 \times 11 + 70 \rceil = \lceil 84.097072 \rceil = 85$ not 84.

Alternatively, $z = \sqrt{2}\,\mathrm{erf}^{-1}(2 \times 0.4) = 1.2815515655\cdots \approx 1.28$ and $a = \lceil \sqrt{2}\,\mathrm{erf}^{-1}(0.8) \times 11 + 70 \rceil = \lceil 84.09706\ldots \rceil = 85$ not 84.

20.4 **Q10(d)** Using Table D, $a = \lceil 1.281552 \times 12 + 70 \rceil = \lceil 85.378624 \rceil = 86$ not 85.

Alternatively, $a = \lceil \sqrt{2}\,\mathrm{erf}^{-1}(0.8) \times 12 + 70 \rceil = \lceil 85.378618786\ldots \rceil = 86$ not 85.

20.5 **Q5(a)** Using Table D and $P = 0.35$, $z = 1.036433$ and
$k = 9.5 \times 1.036433 + 60$

$$= 69.8461135$$

$$\approx 69.85\mathrm{kg} \text{ not } 69.84\mathrm{kg}$$

Using erf^{-1} and $P = 0.35$, $z = \sqrt{2}\,\mathrm{erf}^{-1}(2 \times 0.35) = \sqrt{2}\,\mathrm{erf}^{-1}(0.7)$ and
$k = 9.5 \times \sqrt{2}\,\mathrm{erf}^{-1}(0.7) + 60$

$$= 69.846117200191\ldots$$

$$= 69.85\mathrm{kg} \text{ not } 69.84\mathrm{kg}$$

20.5 **Q5(b)** With Table D and $P = 0.1$, $z = -0.253347$ and
$k = 9.5 \times (-0.253347) + 60$

$$= 57.5932035$$

$$= 57.59\mathrm{kg} \text{ not } 57.63\mathrm{kg}$$

With erf^{-1}, $z = -\sqrt{2}\,\mathrm{erf}^{-1}(2 \times 0.1)$ and

$$k = 9.5 \times (-\sqrt{2}\,\mathrm{erf}^{-1}(0.2)) + 60$$
$$= 57.5932025202\ldots$$
$$= 57.59\text{kg not } 57.63\text{kg}$$

20.5 Q6(b) $10.02 = 180 - \mu$ is correct.
But $\mu = 169.02 \approx 170$cm is incorrect.
It should be $\mu = 169.98 \approx 170$cm.

20.5 Q12(a) $P(X < a) = 0.97$ not 0.9.

20.5 Q12(b) Using Table D with $P(0 < z < k) = 0.87 - 0.5 = 0.37, k = 1.126391$ and score needed is $\lceil 80 + 2\sqrt{5} \times 1.126391 \rceil = 86$ not 85.

Using $\mathrm{erf}^{-1}, k = \sqrt{2}\,\mathrm{erf}^{-1}(2 \times 0.37)$ and score needed is
$\lceil 80 + 2\sqrt{5} \times \sqrt{2}\,\mathrm{erf}^{-1}(0.74) \rceil = \lceil 85.03737426756699\ldots \rceil = 86$ not 85.

20.5 Q13 This question asks for answers correct to 3 decimal places, but the answers given are not correct to 3 decimal places.

20.5 Q13(a) Using Table D and $P(0 < z < z_1) = 0.92 - 0.5 = 0.42, z_1 = 1.405072$ and so

$$k = 2.1 + \sqrt{0.6} \times 1.405072$$
$$= 3.18836409\ldots$$
$$= 3.188\text{kg correct to 3 decimal places not } 3.19\text{kg}$$

Using $\mathrm{erf}^{-1}, z_1 = \sqrt{2}\,\mathrm{erf}^{-1}(2 \times 0.42)$ and
$k = 2.1 + \sqrt{0.6} \times \sqrt{2}\,\mathrm{erf}^{-1}(0.84)$
$$= 3.188363750\ldots$$
$$= 3.188\text{kg correct to 3 decimal places not } 3.19\text{kg}$$

20.5 Q13(b) Using Table D and $P(0 < z < -z_1) = 0.62 - 0.5 = 0.12, z_1 = -0.305481$ and so

$$k = 2.1 - \sqrt{0.6} \times 0.305481$$
$$= 1.863375\ldots$$
$$\approx 1.863\text{kg correct to 3 decimal places not } 1.86\text{kg}$$

Using $\mathrm{erf}^{-1}, z_1 = -\sqrt{2}\,\mathrm{erf}^{-1}(2 \times 0.12)$ and
$k = 2.1 - \sqrt{0.6} \times \sqrt{2}\,\mathrm{erf}^{-1}(0.24)$
$$= 1.863375599\ldots$$
$$\approx 1.863\text{kg correct to 3 decimal places not } 1.86\text{kg}$$

20.5 Q13(c) Using Table D and $P(0 < z < -z_1) = 0.5 - 0.45 = 0.05$, $z_1 = -0.125661$ and so

$k = 2.1 - \sqrt{0.6} \times 0.125661$

$\quad = 2.002663\ldots$

$\quad \approx$ 2.003kg correct to 3 decimal places not 2kg

Using erf^{-1}, $z_1 = -\sqrt{2}\,\mathrm{erf}^{-1}(2 \times 0.05)$ and
$k = 2.1 - \sqrt{0.6} \times \sqrt{2}\,\mathrm{erf}^{-1}(0.1)$

$\quad = 2.0026631\ldots$

$\quad \approx$ 2.003kg correct to 3 decimal places not 2kg

20.5 Q13(d) Using Table D and $P(0 < z < z_1) = 0.5 - 0.16 = 0.34$, $z_1 = 0.994458$ and so

$k = 2.1 + \sqrt{0.6} \times 0.994458$

$\quad = 2.87030385\ldots$

$\quad \approx$ 2.870kg correct to 3 decimal places not 2.87kg

Using erf^{-1}, $z_1 = \sqrt{2}\,\mathrm{erf}^{-1}(2 \times 0.34)$ and
$k = 2.1 + \sqrt{0.6} \times \sqrt{2}\,\mathrm{erf}^{-1}(0.68)$

$\quad = 2.870303764\ldots$

$\quad \approx$ 2.870kg correct to 3 decimal places not 2.87kg

20.5 Q14(g) "$P(0 < X < t) = 0$
$\qquad\qquad 7643 - 0.5 = 0.2643$"
should be $P(0 < X < t) = 0.7643 - 0.5 = 0.2643$

20.5 Q16(b) Notation $P(k_0 < X < k) = 0.5$(or something similar) should be used instead of $P(-k < X < k) = 0.5$ as X does not take on any negative values.

CR20A Q16(c) Using Table D and $P(0 < Z < -z) = 0.75 - 0.5 = 0.25$,
$z = -0.674490 \approx -0.674$ not -0.675.

Using erf^{-1}, $z = -\sqrt{2}\,\mathrm{erf}^{-1}(2 \times 0.25) = -0.674489750196\cdots \approx -0.674$ not -0.675.

CR20A Q18(a) Using Table D and $P(0 < z < z_1) = 0.5 - 0.15 = 0.35$, $z_1 = 1.036433$ and

$k = 120 + 2\sqrt{10} \times 1.036433$

$\quad = 126.554\ldots$

$\quad \approx$ 126.55 not 126.44

Using erf^{-1}, $z_1 = \sqrt{2}\,\mathrm{erf}^{-1}(2 \times 0.35)$ and

$$k = 120 + 2\sqrt{10} \times \sqrt{2}\,\mathrm{erf}^{-1}(0.7)$$
$$= 126.55498\ldots$$
$$\approx 126.55 \text{ not } 126.44$$

CR20A Q18(b) Using Table D and $P(0 < z < -z_1) = 0.5 - 0.25 = 0.25$,
$z_1 = -0.674490$ and

$$k = 120 - 2\sqrt{10} \times 0.674490$$
$$= 115.7341\ldots$$
$$\approx 115.73 \text{ not } 115.74$$

Using erf^{-1}, $z_1 = -\sqrt{2}\,\mathrm{erf}^{-1}(2 \times 0.25)$ and

$$k = 120 - 2\sqrt{10} \times \sqrt{2}\,\mathrm{erf}^{-1}(0.5)$$
$$= 115.7341522\ldots$$
$$\approx 115.73 \text{ not } 115.74$$

CR20A Q26(b) A notation $P(X_0 < X < X_1) = 0.7$, or similar, should be used instead of $P(-a < X < a) = 0.7$ because X never takes on negative values.

Appendix

In the following pages you will find Tables D and E which are P to z tables with z correct to 6 decimal places and P respectively correct to 3 or 4 decimal places. Although I made extensive use of Table D in this article, I did not need to use Table E for any of the corrections. However I am including Table E as well because there are several questions in the notes with P to 4 decimal places where Table E could be used.

For example in Exercise 20.5 Q14(c), if you use Table E you get the answer much more quickly than by using Table B backwards, namely $0.314423 \approx 0.314$.

Reference

Aus, B. & Fitzpatrick, J.B., New Senior Mathematics Advanced 3rd Ed. Chapter 20 (Additional) Sections 20.4 and 20.5, Pearson, 2020.

This is a downloadable pdf NSM3E_ADV_20_Additional.pdf available at https://www.pearsonplaces.com.au - provided you already have access to the ebook. If not then you can get access here: https://www.pearson.com.au/9781488663253

Table D: For a normal distribution, given $P = P(0 < Z < z)$ correct to 3 decimal places, find $z = \sqrt{2}\,\mathrm{erf}^{-1}(2P)$ correct to 6 decimal places.

P to z	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009
0.00	0.000000	0.002507	0.005013	0.007520	0.010027	0.012533	0.015040	0.017547	0.020054	0.022562
0.01	0.025069	0.027576	0.030084	0.032592	0.035100	0.037608	0.040117	0.042626	0.045135	0.047644
0.02	0.050154	0.052664	0.055174	0.057684	0.060195	0.062707	0.065219	0.067731	0.070243	0.072756
0.03	0.075270	0.077784	0.080298	0.082813	0.085329	0.087845	0.090361	0.092879	0.095396	0.097915
0.04	0.100434	0.102953	0.105474	0.107995	0.110516	0.113039	0.115562	0.118085	0.120610	0.123135
0.05	0.125661	0.128188	0.130716	0.133245	0.135774	0.138304	0.140835	0.143367	0.145900	0.148434
0.06	0.150969	0.153505	0.156042	0.158580	0.161119	0.163658	0.166199	0.168741	0.171285	0.173829
0.07	0.176374	0.178921	0.181468	0.184017	0.186567	0.189118	0.191671	0.194225	0.196780	0.199336
0.08	0.201893	0.204452	0.207013	0.209574	0.212137	0.214702	0.217267	0.219835	0.222403	0.224973
0.09	0.227545	0.230118	0.232693	0.235269	0.237847	0.240426	0.243007	0.245590	0.248174	0.250760
0.10	0.253347	0.255936	0.258527	0.261120	0.263714	0.266311	0.268909	0.271508	0.274110	0.276714
0.11	0.279319	0.281926	0.284536	0.287147	0.289760	0.292375	0.294992	0.297611	0.300232	0.302855
0.12	0.305481	0.308108	0.310738	0.313369	0.316003	0.318639	0.321278	0.323918	0.326561	0.329206
0.13	0.331853	0.334503	0.337155	0.339809	0.342466	0.345126	0.347787	0.350451	0.353118	0.355787
0.14	0.358459	0.361133	0.363810	0.366489	0.369171	0.371856	0.374543	0.377234	0.379926	0.382622
0.15	0.385320	0.388022	0.390726	0.393433	0.396142	0.398855	0.401571	0.404289	0.407011	0.409735
0.16	0.412463	0.415194	0.417928	0.420665	0.423405	0.426148	0.428895	0.431644	0.434397	0.437154
0.17	0.439913	0.442676	0.445443	0.448212	0.450985	0.453762	0.456542	0.459326	0.462113	0.464904
0.18	0.467699	0.470497	0.473299	0.476104	0.478914	0.481727	0.484544	0.487365	0.490189	0.493018
0.19	0.495850	0.498687	0.501527	0.504372	0.507221	0.510073	0.512930	0.515792	0.518657	0.521527
0.20	0.524401	0.527279	0.530161	0.533049	0.535940	0.538836	0.541737	0.544642	0.547551	0.550466
0.21	0.553385	0.556308	0.559237	0.562170	0.565108	0.568051	0.570999	0.573952	0.576910	0.579873
0.22	0.582842	0.585815	0.588793	0.591777	0.594766	0.597760	0.600760	0.603765	0.606775	0.609791
0.23	0.612813	0.615840	0.618873	0.621912	0.624956	0.628006	0.631062	0.634124	0.637192	0.640266
0.24	0.643345	0.646431	0.649524	0.652622	0.655727	0.658838	0.661955	0.665079	0.668209	0.671346
0.25	0.674490	0.677640	0.680797	0.683961	0.687131	0.690309	0.693493	0.696685	0.699884	0.703089
0.26	0.706303	0.709523	0.712751	0.715986	0.719229	0.722479	0.725737	0.729003	0.732276	0.735558
0.27	0.738847	0.742144	0.745450	0.748763	0.752085	0.755415	0.758754	0.762101	0.765456	0.768820
0.28	0.772193	0.775575	0.778966	0.782365	0.785774	0.789192	0.792619	0.796055	0.799501	0.802956
0.29	0.806421	0.809896	0.813380	0.816875	0.820379	0.823894	0.827418	0.830953	0.834499	0.838055
0.30	0.841621	0.845199	0.848787	0.852386	0.855996	0.859617	0.863250	0.866894	0.870550	0.874217
0.31	0.877896	0.881587	0.885290	0.889006	0.892733	0.896473	0.900226	0.903991	0.907770	0.911561
0.32	0.915365	0.919183	0.923014	0.926859	0.930717	0.934589	0.938476	0.942376	0.946291	0.950221
0.33	0.954165	0.958124	0.962099	0.966088	0.970093	0.974114	0.978150	0.982203	0.986271	0.990356
0.34	0.994458	0.998576	1.002712	1.006864	1.011034	1.015222	1.019428	1.023651	1.027893	1.032154
0.35	1.036433	1.040732	1.045050	1.049387	1.053744	1.058122	1.062519	1.066938	1.071377	1.075837
0.36	1.080319	1.084823	1.089349	1.093897	1.098468	1.103063	1.107680	1.112321	1.116987	1.121677
0.37	1.126391	1.131131	1.135896	1.140687	1.145505	1.150349	1.155221	1.160120	1.165047	1.170002
0.38	1.174987	1.180001	1.185044	1.190118	1.195223	1.200359	1.205527	1.210727	1.215960	1.221227
0.39	1.226528	1.231864	1.237235	1.242641	1.248085	1.253565	1.259084	1.264641	1.270238	1.275874
0.40	1.281552	1.287271	1.293032	1.298837	1.304685	1.310579	1.316519	1.322505	1.328539	1.334622
0.41	1.340755	1.346939	1.353174	1.359463	1.365806	1.372204	1.378659	1.385172	1.391744	1.398377
0.42	1.405072	1.411830	1.418654	1.425544	1.432503	1.439531	1.446632	1.453806	1.461056	1.468384
0.43	1.475791	1.483280	1.490853	1.498513	1.506262	1.514102	1.522036	1.530068	1.538199	1.546433
0.44	1.554774	1.563224	1.571787	1.580467	1.589268	1.598193	1.607248	1.616436	1.625763	1.635234
0.45	1.644854	1.654628	1.664563	1.674665	1.684941	1.695398	1.706043	1.716886	1.727934	1.739198
0.46	1.750686	1.762410	1.774382	1.786613	1.799118	1.811911	1.825007	1.838424	1.852180	1.866296
0.47	1.880794	1.895698	1.911036	1.926837	1.943134	1.959964	1.977368	1.995393	2.014091	2.033520
0.48	2.053749	2.074855	2.096927	2.120072	2.144411	2.170090	2.197286	2.226212	2.257129	2.290368
0.49	2.326348	2.365618	2.408916	2.457263	2.512144	2.575829	2.652070	2.747781	2.878162	3.090232

Table E: For a normal distribution, given $P = P(0 < Z < z)$ correct to 4 decimal places, find $z = \sqrt{2}\,\mathrm{erf}^{-1}(2P)$ correct to 6 decimal places.

P to z	0.0000	0.0001	0.0002	0.0003	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009
0.000	0.000000	0.000251	0.000501	0.000752	0.001003	0.001253	0.001504	0.001755	0.002005	0.002256
0.001	0.002507	0.002757	0.003008	0.003259	0.003509	0.003760	0.004011	0.004261	0.004512	0.004763
0.002	0.005013	0.005264	0.005515	0.005765	0.006016	0.006267	0.006517	0.006768	0.007019	0.007269
0.003	0.007520	0.007771	0.008021	0.008272	0.008523	0.008773	0.009024	0.009275	0.009525	0.009776
0.004	0.010027	0.010277	0.010528	0.010779	0.011029	0.011280	0.011531	0.011781	0.012032	0.012283
0.005	0.012533	0.012784	0.013035	0.013286	0.013536	0.013787	0.014038	0.014288	0.014539	0.014790
0.006	0.015040	0.015291	0.015542	0.015792	0.016043	0.016294	0.016545	0.016795	0.017046	0.017297
0.007	0.017547	0.017798	0.018049	0.018299	0.018550	0.018801	0.019052	0.019302	0.019553	0.019804
0.008	0.020054	0.020305	0.020556	0.020807	0.021057	0.021308	0.021559	0.021809	0.022060	0.022311
0.009	0.022562	0.022812	0.023063	0.023314	0.023564	0.023815	0.024066	0.024317	0.024567	0.024818
0.010	0.025069	0.025320	0.025570	0.025821	0.026072	0.026323	0.026573	0.026824	0.027075	0.027326
0.011	0.027576	0.027827	0.028078	0.028329	0.028579	0.028830	0.029081	0.029332	0.029583	0.029833
0.012	0.030084	0.030335	0.030586	0.030836	0.031087	0.031338	0.031589	0.031840	0.032090	0.032341
0.013	0.032592	0.032843	0.033094	0.033344	0.033595	0.033846	0.034097	0.034348	0.034598	0.034849
0.014	0.035100	0.035351	0.035602	0.035852	0.036103	0.036354	0.036605	0.036856	0.037107	0.037357
0.015	0.037608	0.037859	0.038110	0.038361	0.038612	0.038863	0.039113	0.039364	0.039615	0.039866
0.016	0.040117	0.040368	0.040619	0.040869	0.041120	0.041371	0.041622	0.041873	0.042124	0.042375
0.017	0.042626	0.042876	0.043127	0.043378	0.043629	0.043880	0.044131	0.044382	0.044633	0.044884
0.018	0.045135	0.045386	0.045636	0.045887	0.046138	0.046389	0.046640	0.046891	0.047142	0.047393
0.019	0.047644	0.047895	0.048146	0.048397	0.048648	0.048899	0.049150	0.049401	0.049652	0.049903
0.020	0.050154	0.050405	0.050656	0.050907	0.051158	0.051409	0.051660	0.051911	0.052162	0.052413
0.021	0.052664	0.052915	0.053166	0.053417	0.053668	0.053919	0.054170	0.054421	0.054672	0.054923
0.022	0.055174	0.055425	0.055676	0.055927	0.056178	0.056429	0.056680	0.056931	0.057182	0.057433
0.023	0.057684	0.057936	0.058187	0.058438	0.058689	0.058940	0.059191	0.059442	0.059693	0.059944
0.024	0.060195	0.060447	0.060698	0.060949	0.061200	0.061451	0.061702	0.061953	0.062204	0.062456
0.025	0.062707	0.062958	0.063209	0.063460	0.063711	0.063963	0.064214	0.064465	0.064716	0.064967
0.026	0.065219	0.065470	0.065721	0.065972	0.066223	0.066475	0.066726	0.066977	0.067228	0.067479
0.027	0.067731	0.067982	0.068233	0.068484	0.068736	0.068987	0.069238	0.069489	0.069741	0.069992
0.028	0.070243	0.070495	0.070746	0.070997	0.071248	0.071500	0.071751	0.072002	0.072254	0.072505
0.029	0.072756	0.073008	0.073259	0.073510	0.073762	0.074013	0.074264	0.074516	0.074767	0.075018
0.030	0.075270	0.075521	0.075773	0.076024	0.076275	0.076527	0.076778	0.077030	0.077281	0.077532
0.031	0.077784	0.078035	0.078287	0.078538	0.078790	0.079041	0.079292	0.079544	0.079795	0.080047
0.032	0.080298	0.080550	0.080801	0.081053	0.081304	0.081556	0.081807	0.082059	0.082310	0.082562
0.033	0.082813	0.083065	0.083316	0.083568	0.083819	0.084071	0.084323	0.084574	0.084826	0.085077
0.034	0.085329	0.085580	0.085832	0.086084	0.086335	0.086587	0.086838	0.087090	0.087342	0.087593
0.035	0.087845	0.088096	0.088348	0.088600	0.088851	0.089103	0.089355	0.089606	0.089858	0.090110
0.036	0.090361	0.090613	0.090865	0.091117	0.091368	0.091620	0.091872	0.092123	0.092375	0.092627
0.037	0.092879	0.093130	0.093382	0.093634	0.093886	0.094137	0.094389	0.094641	0.094893	0.095145
0.038	0.095396	0.095648	0.095900	0.096152	0.096404	0.096655	0.096907	0.097159	0.097411	0.097663
0.039	0.097915	0.098167	0.098418	0.098670	0.098922	0.099174	0.099426	0.099678	0.099930	0.100182
0.040	0.100434	0.100686	0.100938	0.101190	0.101441	0.101693	0.101945	0.102197	0.102449	0.102701
0.041	0.102953	0.103205	0.103457	0.103709	0.103961	0.104213	0.104465	0.104717	0.104970	0.105222
0.042	0.105474	0.105726	0.105978	0.106230	0.106482	0.106734	0.106986	0.107238	0.107490	0.107742
0.043	0.107995	0.108247	0.108499	0.108751	0.109003	0.109255	0.109507	0.109760	0.110012	0.110264
0.044	0.110516	0.110768	0.111021	0.111273	0.111525	0.111777	0.112030	0.112282	0.112534	0.112786
0.045	0.113039	0.113291	0.113543	0.113795	0.114048	0.114300	0.114552	0.114805	0.115057	0.115309
0.046	0.115562	0.115814	0.116066	0.116319	0.116571	0.116823	0.117076	0.117328	0.117581	0.117833
0.047	0.118085	0.118338	0.118590	0.118843	0.119095	0.119348	0.119600	0.119852	0.120105	0.120357
0.048	0.120610	0.120862	0.121115	0.121367	0.121620	0.121872	0.122125	0.122378	0.122630	0.122883
0.049	0.123135	0.123388	0.123640	0.123893	0.124146	0.124398	0.124651	0.124903	0.125156	0.125409
0.050	0.125661	0.125914	0.126167	0.126419	0.126672	0.126925	0.127177	0.127430	0.127683	0.127936
0.051	0.128188	0.128441	0.128694	0.128946	0.129199	0.129452	0.129705	0.129958	0.130210	0.130463
0.052	0.130716	0.130969	0.131222	0.131474	0.131727	0.131980	0.132233	0.132486	0.132739	0.132992
0.053	0.133245	0.133497	0.133750	0.134003	0.134256	0.134509	0.134762	0.135015	0.135268	0.135521
0.054	0.135774	0.136027	0.136280	0.136533	0.136786	0.137039	0.137292	0.137545	0.137798	0.138051
0.055	0.138304	0.138557	0.138810	0.139063	0.139317	0.139570	0.139823	0.140076	0.140329	0.140582
0.056	0.140835	0.141089	0.141342	0.141595	0.141848	0.142101	0.142355	0.142608	0.142861	0.143114
0.057	0.143367	0.143621	0.143874	0.144127	0.144381	0.144634	0.144887	0.145140	0.145394	0.145647

	0.0000	0.0001	0.0002	0.0003	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009
0.058	0.145900	0.146154	0.146407	0.146660	0.146914	0.147167	0.147421	0.147674	0.147927	0.148181
0.059	0.148434	0.148688	0.148941	0.149195	0.149448	0.149702	0.149955	0.150209	0.150462	0.150716
0.060	0.150969	0.151223	0.151476	0.151730	0.151983	0.152237	0.152491	0.152744	0.152998	0.153251
0.061	0.153505	0.153759	0.154012	0.154266	0.154520	0.154773	0.155027	0.155281	0.155534	0.155788
0.062	0.156042	0.156296	0.156549	0.156803	0.157057	0.157311	0.157564	0.157818	0.158072	0.158326
0.063	0.158580	0.158834	0.159087	0.159341	0.159595	0.159849	0.160103	0.160357	0.160611	0.160865
0.064	0.161119	0.161373	0.161626	0.161880	0.162134	0.162388	0.162642	0.162896	0.163150	0.163404
0.065	0.163658	0.163913	0.164167	0.164421	0.164675	0.164929	0.165183	0.165437	0.165691	0.165945
0.066	0.166199	0.166454	0.166708	0.166962	0.167216	0.167470	0.167725	0.167979	0.168233	0.168487
0.067	0.168741	0.168996	0.169250	0.169504	0.169759	0.170013	0.170267	0.170522	0.170776	0.171030
0.068	0.171285	0.171539	0.171793	0.172048	0.172302	0.172557	0.172811	0.173065	0.173320	0.173574
0.069	0.173829	0.174083	0.174338	0.174592	0.174847	0.175101	0.175356	0.175610	0.175865	0.176120
0.070	0.176374	0.176629	0.176883	0.177138	0.177393	0.177647	0.177902	0.178157	0.178411	0.178666
0.071	0.178921	0.179175	0.179430	0.179685	0.179940	0.180194	0.180449	0.180704	0.180959	0.181213
0.072	0.181468	0.181723	0.181978	0.182233	0.182488	0.182743	0.182997	0.183252	0.183507	0.183762
0.073	0.184017	0.184272	0.184527	0.184782	0.185037	0.185292	0.185547	0.185802	0.186057	0.186312
0.074	0.186567	0.186822	0.187077	0.187332	0.187588	0.187843	0.188098	0.188353	0.188608	0.188863
0.075	0.189118	0.189374	0.189629	0.189884	0.190139	0.190395	0.190650	0.190905	0.191160	0.191416
0.076	0.191671	0.191926	0.192182	0.192437	0.192692	0.192948	0.193203	0.193458	0.193714	0.193969
0.077	0.194225	0.194480	0.194736	0.194991	0.195246	0.195502	0.195757	0.196013	0.196269	0.196524
0.078	0.196780	0.197035	0.197291	0.197546	0.197802	0.198058	0.198313	0.198569	0.198825	0.199080
0.079	0.199336	0.199592	0.199847	0.200103	0.200359	0.200615	0.200870	0.201126	0.201382	0.201638
0.080	0.201893	0.202149	0.202405	0.202661	0.202917	0.203173	0.203429	0.203685	0.203940	0.204196
0.081	0.204452	0.204708	0.204964	0.205220	0.205476	0.205732	0.205988	0.206244	0.206500	0.206757
0.082	0.207013	0.207269	0.207525	0.207781	0.208037	0.208293	0.208549	0.208806	0.209062	0.209318
0.083	0.209574	0.209830	0.210087	0.210343	0.210599	0.210856	0.211112	0.211368	0.211624	0.211881
0.084	0.212137	0.212394	0.212650	0.212906	0.213163	0.213419	0.213676	0.213932	0.214189	0.214445
0.085	0.214702	0.214958	0.215215	0.215471	0.215728	0.215984	0.216241	0.216497	0.216754	0.217011
0.086	0.217267	0.217524	0.217781	0.218037	0.218294	0.218551	0.218808	0.219064	0.219321	0.219578
0.087	0.219835	0.220091	0.220348	0.220605	0.220862	0.221119	0.221376	0.221632	0.221889	0.222146
0.088	0.222403	0.222660	0.222917	0.223174	0.223431	0.223688	0.223945	0.224202	0.224459	0.224716
0.089	0.224973	0.225230	0.225488	0.225745	0.226002	0.226259	0.226516	0.226773	0.227031	0.227288
0.090	0.227545	0.227802	0.228059	0.228317	0.228574	0.228831	0.229089	0.229346	0.229603	0.229861
0.091	0.230118	0.230375	0.230633	0.230890	0.231148	0.231405	0.231663	0.231920	0.232178	0.232435
0.092	0.232693	0.232950	0.233208	0.233465	0.233723	0.233981	0.234238	0.234496	0.234754	0.235011
0.093	0.235269	0.235527	0.235784	0.236042	0.236300	0.236558	0.236815	0.237073	0.237331	0.237589
0.094	0.237847	0.238105	0.238362	0.238620	0.238878	0.239136	0.239394	0.239652	0.239910	0.240168
0.095	0.240426	0.240684	0.240942	0.241200	0.241458	0.241716	0.241974	0.242233	0.242491	0.242749
0.096	0.243007	0.243265	0.243523	0.243782	0.244040	0.244298	0.244556	0.244815	0.245073	0.245331
0.097	0.245590	0.245848	0.246106	0.246365	0.246623	0.246881	0.247140	0.247398	0.247657	0.247915
0.098	0.248174	0.248432	0.248691	0.248949	0.249208	0.249466	0.249725	0.249984	0.250242	0.250501
0.099	0.250760	0.251018	0.251277	0.251536	0.251794	0.252053	0.252312	0.252571	0.252829	0.253088
0.100	0.253347	0.253606	0.253865	0.254124	0.254383	0.254642	0.254900	0.255159	0.255418	0.255677
0.101	0.255936	0.256195	0.256454	0.256713	0.256973	0.257232	0.257491	0.257750	0.258009	0.258268
0.102	0.258527	0.258786	0.259046	0.259305	0.259564	0.259823	0.260083	0.260342	0.260601	0.260861
0.103	0.261120	0.261379	0.261639	0.261898	0.262158	0.262417	0.262676	0.262936	0.263195	0.263455
0.104	0.263714	0.263974	0.264233	0.264493	0.264753	0.265012	0.265272	0.265532	0.265791	0.266051
0.105	0.266311	0.266570	0.266830	0.267090	0.267350	0.267609	0.267869	0.268129	0.268389	0.268649
0.106	0.268909	0.269169	0.269428	0.269688	0.269948	0.270208	0.270468	0.270728	0.270988	0.271248
0.107	0.271508	0.271769	0.272029	0.272289	0.272549	0.272809	0.273069	0.273329	0.273590	0.273850
0.108	0.274110	0.274370	0.274631	0.274891	0.275151	0.275412	0.275672	0.275932	0.276193	0.276453
0.109	0.276714	0.276974	0.277235	0.277495	0.277756	0.278016	0.278277	0.278537	0.278798	0.279058
0.110	0.279319	0.279580	0.279840	0.280101	0.280362	0.280622	0.280883	0.281144	0.281405	0.281666
0.111	0.281926	0.282187	0.282448	0.282709	0.282970	0.283231	0.283492	0.283753	0.284014	0.284275
0.112	0.284536	0.284797	0.285058	0.285319	0.285580	0.285841	0.286102	0.286363	0.286624	0.286885
0.113	0.287147	0.287408	0.287669	0.287930	0.288192	0.288453	0.288714	0.288976	0.289237	0.289498
0.114	0.289760	0.290021	0.290283	0.290544	0.290806	0.291067	0.291329	0.291590	0.291852	0.292113
0.115	0.292375	0.292637	0.292898	0.293160	0.293421	0.293683	0.293945	0.294207	0.294468	0.294730
0.116	0.294992	0.295254	0.295516	0.295778	0.296039	0.296301	0.296563	0.296825	0.297087	0.297349

	0.0000	0.0001	0.0002	0.0003	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009
0.117	0.297611	0.297873	0.298135	0.298397	0.298659	0.298921	0.299184	0.299446	0.299708	0.299970
0.118	0.300232	0.300494	0.300757	0.301019	0.301281	0.301544	0.301806	0.302068	0.302331	0.302593
0.119	0.302855	0.303118	0.303380	0.303643	0.303905	0.304168	0.304430	0.304693	0.304956	0.305218
0.120	0.305481	0.305743	0.306006	0.306269	0.306531	0.306794	0.307057	0.307320	0.307583	0.307845
0.121	0.308108	0.308371	0.308634	0.308897	0.309160	0.309423	0.309686	0.309949	0.310212	0.310475
0.122	0.310738	0.311001	0.311264	0.311527	0.311790	0.312053	0.312317	0.312580	0.312843	0.313106
0.123	0.313369	0.313633	0.313896	0.314159	0.314423	0.314686	0.314949	0.315213	0.315476	0.315740
0.124	0.316003	0.316267	0.316530	0.316794	0.317057	0.317321	0.317585	0.317848	0.318112	0.318376
0.125	0.318639	0.318903	0.319167	0.319431	0.319694	0.319958	0.320222	0.320486	0.320750	0.321014
0.126	0.321278	0.321542	0.321806	0.322070	0.322334	0.322598	0.322862	0.323126	0.323390	0.323654
0.127	0.323918	0.324580	0.325243	0.325905	0.326568	0.327231	0.327894	0.328557	0.329220	0.329883
0.128	0.326561	0.326825	0.327090	0.327354	0.327619	0.327883	0.328148	0.328412	0.328677	0.328941
0.129	0.329206	0.329471	0.329735	0.330000	0.330265	0.330529	0.330794	0.331059	0.331324	0.331589
0.130	0.331853	0.332118	0.332383	0.332648	0.332913	0.333178	0.333443	0.333708	0.333973	0.334238
0.131	0.334503	0.334768	0.335033	0.335298	0.335564	0.335829	0.336094	0.336359	0.336624	0.336890
0.132	0.337155	0.337420	0.337686	0.337951	0.338217	0.338482	0.338747	0.339013	0.339278	0.339544
0.133	0.339809	0.340075	0.340341	0.340606	0.340872	0.341138	0.341403	0.341669	0.341935	0.342201
0.134	0.342466	0.342732	0.342998	0.343264	0.343530	0.343796	0.344062	0.344328	0.344593	0.344859
0.135	0.345126	0.345392	0.345658	0.345924	0.346190	0.346456	0.346722	0.346988	0.347255	0.347521
0.136	0.347787	0.348054	0.348320	0.348586	0.348853	0.349119	0.349385	0.349652	0.349918	0.350185
0.137	0.350451	0.350718	0.350984	0.351251	0.351518	0.351784	0.352051	0.352318	0.352584	0.352851
0.138	0.353118	0.353385	0.353652	0.353918	0.354185	0.354452	0.354719	0.354986	0.355253	0.355520
0.139	0.355787	0.356054	0.356321	0.356588	0.356855	0.357123	0.357390	0.357657	0.357924	0.358192
0.140	0.358459	0.358726	0.358993	0.359261	0.359528	0.359796	0.360063	0.360330	0.360598	0.360865
0.141	0.361133	0.361401	0.361668	0.361936	0.362203	0.362471	0.362739	0.363007	0.363274	0.363542
0.142	0.363810	0.364078	0.364346	0.364613	0.364881	0.365149	0.365417	0.365685	0.365953	0.366221
0.143	0.366489	0.366757	0.367025	0.367294	0.367562	0.367830	0.368098	0.368366	0.368635	0.368903
0.144	0.369171	0.369440	0.369708	0.369977	0.370245	0.370513	0.370782	0.371050	0.371319	0.371587
0.145	0.371856	0.372125	0.372393	0.372662	0.372931	0.373199	0.373468	0.373737	0.374006	0.374275
0.146	0.374543	0.374812	0.375081	0.375350	0.375619	0.375888	0.376157	0.376426	0.376695	0.376964
0.147	0.377234	0.377503	0.377772	0.378041	0.378310	0.378580	0.378849	0.379118	0.379388	0.379657
0.148	0.379926	0.380196	0.380465	0.380735	0.381004	0.381274	0.381543	0.381813	0.382083	0.382352
0.149	0.382622	0.382892	0.383162	0.383431	0.383701	0.383971	0.384241	0.384511	0.384781	0.385051
0.150	0.385320	0.385590	0.385860	0.386131	0.386401	0.386671	0.386941	0.387211	0.387481	0.387751
0.151	0.388022	0.388292	0.388562	0.388833	0.389103	0.389373	0.389644	0.389914	0.390185	0.390455
0.152	0.390726	0.390996	0.391267	0.391537	0.391808	0.392079	0.392349	0.392620	0.392891	0.393162
0.153	0.393433	0.393703	0.393974	0.394245	0.394516	0.394787	0.395058	0.395329	0.395600	0.395871
0.154	0.396142	0.396414	0.396685	0.396956	0.397227	0.397498	0.397770	0.398041	0.398312	0.398584
0.155	0.398855	0.399126	0.399398	0.399669	0.399941	0.400213	0.400484	0.400756	0.401027	0.401299
0.156	0.401571	0.401842	0.402114	0.402386	0.402658	0.402930	0.403201	0.403473	0.403745	0.404017
0.157	0.404289	0.404561	0.404833	0.405105	0.405378	0.405650	0.405922	0.406194	0.406466	0.406739
0.158	0.407011	0.407283	0.407556	0.407828	0.408100	0.408373	0.408645	0.408918	0.409190	0.409463
0.159	0.409735	0.410008	0.410281	0.410553	0.410826	0.411099	0.411372	0.411645	0.411917	0.412190
0.160	0.412463	0.412736	0.413009	0.413282	0.413555	0.413828	0.414101	0.414374	0.414647	0.414921
0.161	0.415194	0.415467	0.415740	0.416014	0.416287	0.416560	0.416834	0.417107	0.417381	0.417654
0.162	0.417928	0.418201	0.418475	0.418748	0.419022	0.419296	0.419569	0.419843	0.420117	0.420391
0.163	0.420665	0.420938	0.421212	0.421486	0.421760	0.422034	0.422308	0.422582	0.422856	0.423131
0.164	0.423405	0.423679	0.423953	0.424227	0.424502	0.424776	0.425050	0.425325	0.425599	0.425874
0.165	0.426148	0.426423	0.426697	0.426972	0.427246	0.427521	0.427796	0.428070	0.428345	0.428620
0.166	0.428895	0.429169	0.429444	0.429719	0.429994	0.430269	0.430544	0.430819	0.431094	0.431369
0.167	0.431644	0.431919	0.432195	0.432470	0.432745	0.433020	0.433296	0.433571	0.433846	0.434122
0.168	0.434397	0.434673	0.434948	0.435224	0.435499	0.435775	0.436051	0.436326	0.436602	0.436878
0.169	0.437154	0.437429	0.437705	0.437981	0.438257	0.438533	0.438809	0.439085	0.439361	0.439637
0.170	0.439913	0.440189	0.440465	0.440742	0.441018	0.441294	0.441571	0.441847	0.442123	0.442400
0.171	0.442676	0.442953	0.443229	0.443506	0.443782	0.444059	0.444336	0.444612	0.444889	0.445166
0.172	0.445443	0.445719	0.445996	0.446273	0.446550	0.446827	0.447104	0.447381	0.447658	0.447935
0.173	0.448212	0.448489	0.448767	0.449044	0.449321	0.449598	0.449876	0.450153	0.450431	0.450708
0.174	0.450985	0.451263	0.451541	0.451818	0.452096	0.452373	0.452651	0.452929	0.453207	0.453484
0.175	0.453762	0.454040	0.454318	0.454596	0.454874	0.455152	0.455430	0.455708	0.455986	0.456264

	0.0000	0.0001	0.0002	0.0003	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009
0.176	0.456542	0.456821	0.457099	0.457377	0.457655	0.457934	0.458212	0.458491	0.458769	0.459048
0.177	0.459326	0.459605	0.459883	0.460162	0.460441	0.460719	0.460998	0.461277	0.461556	0.461835
0.178	0.462113	0.462392	0.462671	0.462950	0.463229	0.463508	0.463787	0.464067	0.464346	0.464625
0.179	0.464904	0.465184	0.465463	0.465742	0.466022	0.466301	0.466581	0.466860	0.467140	0.467419
0.180	0.467699	0.467978	0.468258	0.468538	0.468818	0.469097	0.469377	0.469657	0.469937	0.470217
0.181	0.470497	0.470777	0.471057	0.471337	0.471617	0.471897	0.472178	0.472458	0.472738	0.473018
0.182	0.473299	0.473579	0.473860	0.474140	0.474421	0.474701	0.474982	0.475262	0.475543	0.475824
0.183	0.476104	0.476385	0.476666	0.476947	0.477228	0.477509	0.477790	0.478071	0.478352	0.478633
0.184	0.478914	0.479195	0.479476	0.479757	0.480039	0.480320	0.480601	0.480883	0.481164	0.481445
0.185	0.481727	0.482008	0.482290	0.482572	0.482853	0.483135	0.483417	0.483698	0.483980	0.484262
0.186	0.484544	0.484826	0.485108	0.485390	0.485672	0.485954	0.486236	0.486518	0.486800	0.487082
0.187	0.487365	0.487647	0.487929	0.488212	0.488494	0.488776	0.489059	0.489341	0.489624	0.489907
0.188	0.490189	0.490472	0.490755	0.491037	0.491320	0.491603	0.491886	0.492169	0.492452	0.492735
0.189	0.493018	0.493301	0.493584	0.493867	0.494150	0.494434	0.494717	0.495000	0.495284	0.495567
0.190	0.495850	0.496134	0.496417	0.496701	0.496984	0.497268	0.497552	0.497835	0.498119	0.498403
0.191	0.498687	0.498971	0.499255	0.499539	0.499823	0.500107	0.500391	0.500675	0.500959	0.501243
0.192	0.501527	0.501812	0.502096	0.502380	0.502665	0.502949	0.503234	0.503518	0.503803	0.504087
0.193	0.504372	0.504657	0.504941	0.505226	0.505511	0.505796	0.506081	0.506366	0.506651	0.506936
0.194	0.507221	0.507506	0.507791	0.508076	0.508361	0.508647	0.508932	0.509217	0.509503	0.509788
0.195	0.510073	0.510359	0.510645	0.510930	0.511216	0.511501	0.511787	0.512073	0.512359	0.512645
0.196	0.512930	0.513216	0.513502	0.513788	0.514074	0.514360	0.514647	0.514933	0.515219	0.515505
0.197	0.515792	0.516078	0.516364	0.516651	0.516937	0.517224	0.517510	0.517797	0.518084	0.518370
0.198	0.518657	0.518944	0.519231	0.519517	0.519804	0.520091	0.520378	0.520665	0.520952	0.521239
0.199	0.521527	0.521814	0.522101	0.522388	0.522676	0.522963	0.523250	0.523538	0.523825	0.524113
0.200	0.524401	0.524688	0.524976	0.525264	0.525551	0.525839	0.526127	0.526415	0.526703	0.526991
0.201	0.527279	0.527567	0.527855	0.528143	0.528431	0.528720	0.529008	0.529296	0.529585	0.529873
0.202	0.530161	0.530450	0.530739	0.531027	0.531316	0.531604	0.531893	0.532182	0.532471	0.532760
0.203	0.533049	0.533337	0.533626	0.533915	0.534205	0.534494	0.534783	0.535072	0.535361	0.535651
0.204	0.535940	0.536229	0.536519	0.536808	0.537098	0.537387	0.537677	0.537967	0.538256	0.538546
0.205	0.538836	0.539126	0.539416	0.539706	0.539996	0.540286	0.540576	0.540866	0.541156	0.541446
0.206	0.541737	0.542027	0.542317	0.542608	0.542898	0.543189	0.543479	0.543770	0.544060	0.544351
0.207	0.544642	0.544932	0.545223	0.545514	0.545805	0.546096	0.546387	0.546678	0.546969	0.547260
0.208	0.547551	0.547843	0.548134	0.548425	0.548717	0.549008	0.549299	0.549591	0.549882	0.550174
0.209	0.550466	0.550757	0.551049	0.551341	0.551633	0.551925	0.552217	0.552509	0.552801	0.553093
0.210	0.553385	0.553677	0.553969	0.554261	0.554554	0.554846	0.555138	0.555431	0.555723	0.556016
0.211	0.556308	0.556601	0.556894	0.557187	0.557479	0.557772	0.558065	0.558358	0.558651	0.558944
0.212	0.559237	0.559530	0.559823	0.560116	0.560410	0.560703	0.560996	0.561290	0.561583	0.561877
0.213	0.562170	0.562464	0.562758	0.563051	0.563345	0.563639	0.563933	0.564226	0.564520	0.564814
0.214	0.565108	0.565403	0.565697	0.565991	0.566285	0.566579	0.566874	0.567168	0.567462	0.567757
0.215	0.568051	0.568346	0.568641	0.568935	0.569230	0.569525	0.569820	0.570115	0.570409	0.570704
0.216	0.570999	0.571295	0.571590	0.571885	0.572180	0.572475	0.572771	0.573066	0.573361	0.573657
0.217	0.573952	0.574248	0.574544	0.574839	0.575135	0.575431	0.575727	0.576022	0.576318	0.576614
0.218	0.576910	0.577206	0.577503	0.577799	0.578095	0.578391	0.578688	0.578984	0.579280	0.579577
0.219	0.579873	0.580170	0.580467	0.580763	0.581060	0.581357	0.581654	0.581951	0.582247	0.582544
0.220	0.582842	0.583139	0.583436	0.583733	0.584030	0.584327	0.584625	0.584922	0.585220	0.585517
0.221	0.585815	0.586112	0.586410	0.586708	0.587006	0.587303	0.587601	0.587899	0.588197	0.588495
0.222	0.588793	0.589091	0.589390	0.589688	0.589986	0.590284	0.590583	0.590881	0.591180	0.591478
0.223	0.591777	0.592076	0.592374	0.592673	0.592972	0.593271	0.593570	0.593869	0.594168	0.594467
0.224	0.594766	0.595065	0.595364	0.595664	0.595963	0.596262	0.596562	0.596861	0.597161	0.597460
0.225	0.597760	0.598060	0.598360	0.598659	0.598959	0.599259	0.599559	0.599859	0.600159	0.600460
0.226	0.600760	0.601060	0.601360	0.601661	0.601961	0.602262	0.602562	0.602863	0.603163	0.603464
0.227	0.603765	0.604066	0.604367	0.604667	0.604968	0.605269	0.605570	0.605872	0.606173	0.606474
0.228	0.606775	0.607077	0.607378	0.607680	0.607981	0.608283	0.608584	0.608886	0.609188	0.609490
0.229	0.609791	0.610093	0.610395	0.610697	0.610999	0.611301	0.611604	0.611906	0.612208	0.612511
0.230	0.612813	0.613115	0.613418	0.613721	0.614023	0.614326	0.614629	0.614931	0.615234	0.615537
0.231	0.615840	0.616143	0.616446	0.616749	0.617053	0.617356	0.617659	0.617963	0.618266	0.618569
0.232	0.618873	0.619177	0.619480	0.619784	0.620088	0.620392	0.620695	0.620999	0.621303	0.621607
0.233	0.621912	0.622216	0.622520	0.622824	0.623129	0.623433	0.623737	0.624042	0.624347	0.624651
0.234	0.624956	0.625261	0.625565	0.625870	0.626175	0.626480	0.626785	0.627090	0.627396	0.627701

	0.0000	0.0001	0.0002	0.0003	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009
0.235	0.628006	0.628311	0.628617	0.628922	0.629228	0.629533	0.629839	0.630145	0.630450	0.630756
0.236	0.631062	0.631368	0.631674	0.631980	0.632286	0.632592	0.632898	0.633205	0.633511	0.633817
0.237	0.634124	0.634430	0.634737	0.635044	0.635350	0.635657	0.635964	0.636271	0.636578	0.636885
0.238	0.637192	0.637499	0.637806	0.638113	0.638420	0.638728	0.639035	0.639343	0.639650	0.639958
0.239	0.640266	0.640573	0.640881	0.641189	0.641497	0.641805	0.642113	0.642421	0.642729	0.643037
0.240	0.643345	0.643654	0.643962	0.644271	0.644579	0.644888	0.645196	0.645505	0.645814	0.646123
0.241	0.646431	0.646740	0.647049	0.647358	0.647668	0.647977	0.648286	0.648595	0.648905	0.649214
0.242	0.649524	0.649833	0.650143	0.650452	0.650762	0.651072	0.651382	0.651692	0.652002	0.652312
0.243	0.652622	0.652932	0.653242	0.653553	0.653863	0.654174	0.654484	0.654795	0.655105	0.655416
0.244	0.655727	0.656037	0.656348	0.656659	0.656970	0.657281	0.657593	0.657904	0.658215	0.658526
0.245	0.658838	0.659149	0.659461	0.659772	0.660084	0.660396	0.660707	0.661019	0.661331	0.661643
0.246	0.661955	0.662267	0.662579	0.662892	0.663204	0.663516	0.663829	0.664141	0.664454	0.664766
0.247	0.665079	0.665392	0.665704	0.666017	0.666330	0.666643	0.666956	0.667270	0.667583	0.667896
0.248	0.668209	0.668523	0.668836	0.669150	0.669463	0.669777	0.670091	0.670404	0.670718	0.671032
0.249	0.671346	0.671660	0.671974	0.672289	0.672603	0.672917	0.673232	0.673546	0.673861	0.674175
0.250	0.674490	0.674804	0.675119	0.675434	0.675749	0.676064	0.676379	0.676694	0.677009	0.677325
0.251	0.677640	0.677955	0.678271	0.678586	0.678902	0.679218	0.679533	0.679849	0.680165	0.680481
0.252	0.680797	0.681113	0.681429	0.681745	0.682062	0.682378	0.682694	0.683011	0.683327	0.683644
0.253	0.683961	0.684277	0.684594	0.684911	0.685228	0.685545	0.685862	0.686179	0.686497	0.686814
0.254	0.687131	0.687449	0.687766	0.688084	0.688401	0.688719	0.689037	0.689355	0.689673	0.689991
0.255	0.690309	0.690627	0.690945	0.691263	0.691582	0.691900	0.692219	0.692537	0.692856	0.693175
0.256	0.693493	0.693812	0.694131	0.694450	0.694769	0.695088	0.695407	0.695727	0.696046	0.696365
0.257	0.696685	0.697004	0.697324	0.697644	0.697964	0.698283	0.698603	0.698923	0.699243	0.699563
0.258	0.699884	0.700204	0.700524	0.700845	0.701165	0.701486	0.701806	0.702127	0.702448	0.702769
0.259	0.703089	0.703410	0.703731	0.704053	0.704374	0.704695	0.705016	0.705338	0.705659	0.705981
0.260	0.706303	0.706624	0.706946	0.707268	0.707590	0.707912	0.708234	0.708556	0.708878	0.709201
0.261	0.709523	0.709845	0.710168	0.710491	0.710813	0.711136	0.711459	0.711782	0.712105	0.712428
0.262	0.712751	0.713074	0.713397	0.713721	0.714044	0.714367	0.714691	0.715015	0.715338	0.715662
0.263	0.715986	0.716310	0.716634	0.716958	0.717282	0.717606	0.717931	0.718255	0.718580	0.718904
0.264	0.719229	0.719553	0.719878	0.720203	0.720528	0.720853	0.721178	0.721503	0.721828	0.722154
0.265	0.722479	0.722805	0.723130	0.723456	0.723781	0.724107	0.724433	0.724759	0.725085	0.725411
0.266	0.725737	0.726063	0.726390	0.726716	0.727042	0.727369	0.727696	0.728022	0.728349	0.728676
0.267	0.729003	0.729330	0.729657	0.729984	0.730311	0.730638	0.730966	0.731293	0.731621	0.731949
0.268	0.732276	0.732604	0.732932	0.733260	0.733588	0.733916	0.734244	0.734572	0.734901	0.735229
0.269	0.735558	0.735886	0.736215	0.736544	0.736872	0.737201	0.737530	0.737859	0.738188	0.738518
0.270	0.738847	0.739176	0.739506	0.739835	0.740165	0.740494	0.740824	0.741154	0.741484	0.741814
0.271	0.742144	0.742474	0.742805	0.743135	0.743465	0.743796	0.744126	0.744457	0.744788	0.745119
0.272	0.745450	0.745781	0.746112	0.746443	0.746774	0.747105	0.747437	0.747768	0.748100	0.748431
0.273	0.748763	0.749095	0.749427	0.749759	0.750091	0.750423	0.750755	0.751087	0.751420	0.751752
0.274	0.752085	0.752418	0.752750	0.753083	0.753416	0.753749	0.754082	0.754415	0.754748	0.755082
0.275	0.755415	0.755748	0.756082	0.756416	0.756749	0.757083	0.757417	0.757751	0.758085	0.758419
0.276	0.758754	0.759088	0.759422	0.759757	0.760091	0.760426	0.760761	0.761096	0.761430	0.761765
0.277	0.762101	0.762436	0.762771	0.763106	0.763442	0.763777	0.764113	0.764449	0.764784	0.765120
0.278	0.765456	0.765792	0.766128	0.766464	0.766801	0.767137	0.767474	0.767810	0.768147	0.768483
0.279	0.768820	0.769157	0.769494	0.769831	0.770168	0.770506	0.770843	0.771180	0.771518	0.771856
0.280	0.772193	0.772531	0.772869	0.773207	0.773545	0.773883	0.774221	0.774559	0.774898	0.775236
0.281	0.775575	0.775914	0.776252	0.776591	0.776930	0.777269	0.777608	0.777947	0.778287	0.778626
0.282	0.778966	0.779305	0.779645	0.779984	0.780324	0.780664	0.781004	0.781344	0.781685	0.782025
0.283	0.782365	0.782706	0.783046	0.783387	0.783728	0.784068	0.784409	0.784750	0.785091	0.785433
0.284	0.785774	0.786115	0.786457	0.786798	0.787140	0.787482	0.787823	0.788165	0.788507	0.788849
0.285	0.789192	0.789534	0.789876	0.790219	0.790561	0.790904	0.791247	0.791590	0.791933	0.792276
0.286	0.792619	0.792962	0.793305	0.793649	0.793992	0.794336	0.794679	0.795023	0.795367	0.795711
0.287	0.796055	0.796399	0.796744	0.797088	0.797432	0.797777	0.798121	0.798466	0.798811	0.799156
0.288	0.799501	0.799846	0.800191	0.800537	0.800882	0.801227	0.801573	0.801919	0.802264	0.802610
0.289	0.802956	0.803302	0.803649	0.803995	0.804341	0.804688	0.805034	0.805381	0.805727	0.806074
0.290	0.806421	0.806768	0.807115	0.807463	0.807810	0.808157	0.808505	0.808852	0.809200	0.809548
0.291	0.809896	0.810244	0.810592	0.810940	0.811289	0.811637	0.811985	0.812334	0.812683	0.813031
0.292	0.813380	0.813729	0.814078	0.814428	0.814777	0.815126	0.815476	0.815825	0.816175	0.816525
0.293	0.816875	0.817225	0.817575	0.817925	0.818275	0.818626	0.818976	0.819327	0.819677	0.820028

	0.0000	0.0001	0.0002	0.0003	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009
0.294	0.820379	0.820730	0.821081	0.821432	0.821784	0.822135	0.822487	0.822838	0.823190	0.823542
0.295	0.823894	0.824246	0.824598	0.824950	0.825302	0.825655	0.826007	0.826360	0.826713	0.827065
0.296	0.827418	0.827771	0.828124	0.828478	0.828831	0.829185	0.829538	0.829892	0.830245	0.830599
0.297	0.830953	0.831307	0.831662	0.832016	0.832370	0.832725	0.833079	0.833434	0.833789	0.834144
0.298	0.834499	0.834854	0.835209	0.835564	0.835920	0.836275	0.836631	0.836987	0.837343	0.837699
0.299	0.838055	0.838411	0.838767	0.839124	0.839480	0.839837	0.840193	0.840550	0.840907	0.841264
0.300	0.841621	0.841978	0.842336	0.842693	0.843051	0.843409	0.843766	0.844124	0.844482	0.844840
0.301	0.845199	0.845557	0.845915	0.846274	0.846632	0.846991	0.847350	0.847709	0.848068	0.848427
0.302	0.848787	0.849146	0.849506	0.849865	0.850225	0.850585	0.850945	0.851305	0.851665	0.852025
0.303	0.852386	0.852746	0.853107	0.853468	0.853829	0.854190	0.854551	0.854912	0.855273	0.855634
0.304	0.855996	0.856358	0.856719	0.857081	0.857443	0.857805	0.858167	0.858530	0.858892	0.859255
0.305	0.859617	0.859980	0.860343	0.860706	0.861069	0.861432	0.861796	0.862159	0.862523	0.862886
0.306	0.863250	0.863614	0.863978	0.864342	0.864706	0.865071	0.865435	0.865800	0.866164	0.866529
0.307	0.866894	0.867259	0.867624	0.867990	0.868355	0.868721	0.869086	0.869452	0.869818	0.870184
0.308	0.870550	0.870916	0.871282	0.871649	0.872015	0.872382	0.872749	0.873116	0.873483	0.873850
0.309	0.874217	0.874585	0.874952	0.875320	0.875687	0.876055	0.876423	0.876791	0.877160	0.877528
0.310	0.877896	0.878265	0.878634	0.879002	0.879371	0.879740	0.880109	0.880479	0.880848	0.881218
0.311	0.881587	0.881957	0.882327	0.882697	0.883067	0.883437	0.883808	0.884178	0.884549	0.884920
0.312	0.885290	0.885661	0.886033	0.886404	0.886775	0.887147	0.887518	0.887890	0.888262	0.888634
0.313	0.889006	0.889378	0.889750	0.890123	0.890495	0.890868	0.891241	0.891614	0.891987	0.892360
0.314	0.892733	0.893107	0.893480	0.893854	0.894228	0.894602	0.894976	0.895350	0.895724	0.896099
0.315	0.896473	0.896848	0.897223	0.897598	0.897973	0.898348	0.898723	0.899099	0.899474	0.899850
0.316	0.900226	0.900602	0.900978	0.901354	0.901731	0.902107	0.902484	0.902860	0.903237	0.903614
0.317	0.903991	0.904369	0.904746	0.905123	0.905501	0.905879	0.906257	0.906635	0.907013	0.907391
0.318	0.907770	0.908148	0.908527	0.908906	0.909284	0.909663	0.910043	0.910422	0.910801	0.911181
0.319	0.911561	0.911941	0.912321	0.912701	0.913081	0.913461	0.913842	0.914222	0.914603	0.914984
0.320	0.915365	0.915746	0.916128	0.916509	0.916891	0.917272	0.917654	0.918036	0.918418	0.918800
0.321	0.919183	0.919565	0.919948	0.920331	0.920714	0.921097	0.921480	0.921863	0.922247	0.922630
0.322	0.923014	0.923398	0.923782	0.924166	0.924550	0.924934	0.925319	0.925704	0.926088	0.926473
0.323	0.926859	0.927244	0.927629	0.928015	0.928400	0.928786	0.929172	0.929558	0.929944	0.930330
0.324	0.930717	0.931104	0.931490	0.931877	0.932264	0.932651	0.933039	0.933426	0.933814	0.934201
0.325	0.934589	0.934977	0.935365	0.935754	0.936142	0.936531	0.936919	0.937308	0.937697	0.938086
0.326	0.938476	0.938865	0.939255	0.939644	0.940034	0.940424	0.940814	0.941205	0.941595	0.941986
0.327	0.942376	0.942767	0.943158	0.943549	0.943941	0.944332	0.944724	0.945115	0.945507	0.945899
0.328	0.946291	0.946684	0.947076	0.947469	0.947861	0.948254	0.948647	0.949041	0.949434	0.949827
0.329	0.950221	0.950615	0.951009	0.951403	0.951797	0.952191	0.952586	0.952980	0.953375	0.953770
0.330	0.954165	0.954561	0.954956	0.955351	0.955747	0.956143	0.956539	0.956935	0.957331	0.957728
0.331	0.958124	0.958521	0.958918	0.959315	0.959712	0.960110	0.960507	0.960905	0.961303	0.961701
0.332	0.962099	0.962497	0.962895	0.963294	0.963693	0.964092	0.964491	0.964890	0.965289	0.965689
0.333	0.966088	0.966488	0.966888	0.967288	0.967688	0.968089	0.968489	0.968890	0.969291	0.969692
0.334	0.970093	0.970495	0.970896	0.971298	0.971700	0.972102	0.972504	0.972906	0.973308	0.973711
0.335	0.974114	0.974517	0.974920	0.975323	0.975727	0.976130	0.976534	0.976938	0.977342	0.977746
0.336	0.978150	0.978555	0.978959	0.979364	0.979769	0.980174	0.980580	0.980985	0.981391	0.981797
0.337	0.982203	0.982609	0.983015	0.983422	0.983828	0.984235	0.984642	0.985049	0.985456	0.985864
0.338	0.986271	0.986679	0.987087	0.987495	0.987903	0.988312	0.988720	0.989129	0.989538	0.989947
0.339	0.990356	0.990766	0.991175	0.991585	0.991995	0.992405	0.992815	0.993226	0.993636	0.994047
0.340	0.994458	0.994869	0.995280	0.995692	0.996103	0.996515	0.996927	0.997339	0.997751	0.998164
0.341	0.998576	0.998989	0.999402	0.999815	1.000228	1.000642	1.001055	1.001469	1.001883	1.002297
0.342	1.002712	1.003126	1.003541	1.003956	1.004371	1.004786	1.005201	1.005617	1.006032	1.006448
0.343	1.006864	1.007280	1.007697	1.008113	1.008530	1.008947	1.009364	1.009781	1.010199	1.010617
0.344	1.011034	1.011452	1.011870	1.012289	1.012707	1.013126	1.013545	1.013964	1.014383	1.014802
0.345	1.015222	1.015642	1.016062	1.016482	1.016902	1.017323	1.017743	1.018164	1.018585	1.019006
0.346	1.019428	1.019849	1.020271	1.020693	1.021115	1.021537	1.021960	1.022382	1.022805	1.023228
0.347	1.023651	1.024075	1.024498	1.024922	1.025346	1.025770	1.026194	1.026619	1.027043	1.027468
0.348	1.027893	1.028319	1.028744	1.029170	1.029595	1.030021	1.030447	1.030874	1.031300	1.031727
0.349	1.032154	1.032581	1.033008	1.033436	1.033863	1.034291	1.034719	1.035148	1.035576	1.036005
0.350	1.036433	1.036862	1.037292	1.037721	1.038150	1.038580	1.039010	1.039440	1.039871	1.040301
0.351	1.040732	1.041163	1.041594	1.042025	1.042457	1.042888	1.043320	1.043752	1.044185	1.044617
0.352	1.045050	1.045483	1.045916	1.046349	1.046782	1.047216	1.047650	1.048084	1.048518	1.048952

	0.0000	0.0001	0.0002	0.0003	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009
0.353	1.049387	1.049822	1.050257	1.050692	1.051128	1.051563	1.051999	1.052435	1.052871	1.053308
0.354	1.053744	1.054181	1.054618	1.055055	1.055493	1.055930	1.056368	1.056806	1.057245	1.057683
0.355	1.058122	1.058560	1.059000	1.059439	1.059878	1.060318	1.060758	1.061198	1.061638	1.062079
0.356	1.062519	1.062960	1.063401	1.063843	1.064284	1.064726	1.065168	1.065610	1.066052	1.066495
0.357	1.066938	1.067381	1.067824	1.068267	1.068711	1.069155	1.069599	1.070043	1.070487	1.070932
0.358	1.071377	1.071822	1.072267	1.072713	1.073159	1.073604	1.074051	1.074497	1.074944	1.075390
0.359	1.075837	1.076285	1.076732	1.077180	1.077628	1.078076	1.078524	1.078972	1.079421	1.079870
0.360	1.080319	1.080769	1.081218	1.081668	1.082118	1.082568	1.083019	1.083470	1.083921	1.084372
0.361	1.084823	1.085275	1.085727	1.086179	1.086631	1.087083	1.087536	1.087989	1.088442	1.088895
0.362	1.089349	1.089803	1.090257	1.090711	1.091166	1.091620	1.092075	1.092530	1.092986	1.093442
0.363	1.093897	1.094353	1.094810	1.095266	1.095723	1.096180	1.096637	1.097095	1.097552	1.098010
0.364	1.098468	1.098927	1.099385	1.099844	1.100303	1.100763	1.101222	1.101682	1.102142	1.102602
0.365	1.103063	1.103523	1.103984	1.104445	1.104907	1.105368	1.105830	1.106292	1.106755	1.107217
0.366	1.107680	1.108143	1.108606	1.109070	1.109534	1.109998	1.110462	1.110926	1.111391	1.111856
0.367	1.112321	1.112787	1.113253	1.113718	1.114185	1.114651	1.115118	1.115585	1.116052	1.116519
0.368	1.116987	1.117455	1.117923	1.118391	1.118860	1.119329	1.119798	1.120267	1.120737	1.121206
0.369	1.121677	1.122147	1.122617	1.123088	1.123559	1.124031	1.124502	1.124974	1.125446	1.125919
0.370	1.126391	1.126864	1.127337	1.127810	1.128284	1.128758	1.129232	1.129706	1.130181	1.130656
0.371	1.131131	1.131606	1.132082	1.132558	1.133034	1.133510	1.133987	1.134464	1.134941	1.135419
0.372	1.135896	1.136374	1.136852	1.137331	1.137810	1.138289	1.138768	1.139247	1.139727	1.140207
0.373	1.140687	1.141168	1.141649	1.142130	1.142611	1.143093	1.143575	1.144057	1.144539	1.145022
0.374	1.145505	1.145988	1.146472	1.146956	1.147440	1.147924	1.148408	1.148893	1.149378	1.149864
0.375	1.150349	1.150835	1.151321	1.151808	1.152295	1.152782	1.153269	1.153757	1.154244	1.154732
0.376	1.155221	1.155710	1.156198	1.156688	1.157177	1.157667	1.158157	1.158647	1.159138	1.159629
0.377	1.160120	1.160611	1.161103	1.161595	1.162087	1.162580	1.163073	1.163566	1.164059	1.164553
0.378	1.165047	1.165541	1.166036	1.166531	1.167026	1.167521	1.168017	1.168513	1.169009	1.169506
0.379	1.170002	1.170500	1.170997	1.171495	1.171993	1.172491	1.172990	1.173488	1.173988	1.174487
0.380	1.174987	1.175487	1.175987	1.176488	1.176989	1.177490	1.177991	1.178493	1.178995	1.179498
0.381	1.180001	1.180504	1.181007	1.181510	1.182014	1.182519	1.183023	1.183528	1.184033	1.184538
0.382	1.185044	1.185550	1.186056	1.186563	1.187070	1.187577	1.188085	1.188593	1.189101	1.189609
0.383	1.190118	1.190627	1.191137	1.191646	1.192156	1.192667	1.193177	1.193688	1.194199	1.194711
0.384	1.195223	1.195735	1.196247	1.196760	1.197273	1.197787	1.198301	1.198815	1.199329	1.199844
0.385	1.200359	1.200874	1.201390	1.201906	1.202422	1.202939	1.203456	1.203973	1.204491	1.205009
0.386	1.205527	1.206045	1.206564	1.207083	1.207603	1.208123	1.208643	1.209164	1.209684	1.210206
0.387	1.210727	1.211249	1.211771	1.212294	1.212816	1.213340	1.213863	1.214387	1.214911	1.215436
0.388	1.215960	1.216486	1.217011	1.217537	1.218063	1.218590	1.219116	1.219644	1.220171	1.220699
0.389	1.221227	1.221756	1.222285	1.222814	1.223343	1.223873	1.224404	1.224934	1.225465	1.225996
0.390	1.226528	1.227060	1.227592	1.228125	1.228658	1.229192	1.229725	1.230259	1.230794	1.231329
0.391	1.231864	1.232399	1.232935	1.233471	1.234008	1.234545	1.235082	1.235620	1.236158	1.236696
0.392	1.237235	1.237774	1.238313	1.238853	1.239393	1.239933	1.240474	1.241016	1.241557	1.242099
0.393	1.242641	1.243184	1.243727	1.244271	1.244814	1.245359	1.245903	1.246448	1.246993	1.247539
0.394	1.248085	1.248631	1.249178	1.249725	1.250273	1.250820	1.251369	1.251917	1.252466	1.253016
0.395	1.253565	1.254116	1.254666	1.255217	1.255768	1.256320	1.256872	1.257424	1.257977	1.258530
0.396	1.259084	1.259638	1.260192	1.260747	1.261302	1.261858	1.262414	1.262970	1.263527	1.264084
0.397	1.264641	1.265199	1.265757	1.266316	1.266875	1.267434	1.267994	1.268555	1.269115	1.269676
0.398	1.270238	1.270799	1.271362	1.271924	1.272487	1.273051	1.273615	1.274179	1.274744	1.275309
0.399	1.275874	1.276440	1.277006	1.277573	1.278140	1.278708	1.279276	1.279844	1.280413	1.280982
0.400	1.281552	1.282122	1.282692	1.283263	1.283834	1.284406	1.284978	1.285550	1.286123	1.286697
0.401	1.287271	1.287845	1.288419	1.288994	1.289570	1.290146	1.290722	1.291299	1.291876	1.292454
0.402	1.293032	1.293610	1.294189	1.294769	1.295349	1.295929	1.296510	1.297091	1.297672	1.298254
0.403	1.298837	1.299420	1.300003	1.300587	1.301171	1.301755	1.302341	1.302926	1.303512	1.304099
0.404	1.304685	1.305273	1.305861	1.306449	1.307037	1.307627	1.308216	1.308806	1.309397	1.309988
0.405	1.310579	1.311171	1.311763	1.312356	1.312949	1.313543	1.314137	1.314732	1.315327	1.315923
0.406	1.316519	1.317115	1.317712	1.318310	1.318908	1.319506	1.320105	1.320704	1.321304	1.321904
0.407	1.322505	1.323106	1.323708	1.324310	1.324913	1.325516	1.326120	1.326724	1.327329	1.327934
0.408	1.328539	1.329145	1.329752	1.330359	1.330967	1.331575	1.332183	1.332792	1.333402	1.334012
0.409	1.334622	1.335233	1.335845	1.336457	1.337069	1.337682	1.338296	1.338910	1.339524	1.340139
0.410	1.340755	1.341371	1.341988	1.342605	1.343222	1.343840	1.344459	1.345078	1.345698	1.346318
0.411	1.346939	1.347560	1.348182	1.348804	1.349427	1.350050	1.350674	1.351298	1.351923	1.352548

	0.0000	0.0001	0.0002	0.0003	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009
0.412	1.353174	1.353801	1.354428	1.355055	1.355683	1.356312	1.356941	1.357571	1.358201	1.358831
0.413	1.359463	1.360095	1.360727	1.361360	1.361993	1.362627	1.363262	1.363897	1.364533	1.365169
0.414	1.365806	1.366443	1.367081	1.367719	1.368358	1.368998	1.369638	1.370278	1.370920	1.371561
0.415	1.372204	1.372847	1.373490	1.374134	1.374779	1.375424	1.376070	1.376716	1.377363	1.378011
0.416	1.378659	1.379307	1.379957	1.380606	1.381257	1.381908	1.382559	1.383212	1.383864	1.384518
0.417	1.385172	1.385826	1.386481	1.387137	1.387793	1.388450	1.389108	1.389766	1.390425	1.391084
0.418	1.391744	1.392404	1.393065	1.393727	1.394390	1.395053	1.395716	1.396380	1.397045	1.397711
0.419	1.398377	1.399043	1.399711	1.400379	1.401047	1.401716	1.402386	1.403056	1.403728	1.404399
0.420	1.405072	1.405745	1.406418	1.407092	1.407767	1.408443	1.409119	1.409796	1.410473	1.411151
0.421	1.411830	1.412509	1.413190	1.413870	1.414552	1.415234	1.415916	1.416600	1.417284	1.417968
0.422	1.418654	1.419340	1.420026	1.420714	1.421402	1.422090	1.422780	1.423470	1.424161	1.424852
0.423	1.425544	1.426237	1.426930	1.427624	1.428319	1.429015	1.429711	1.430408	1.431105	1.431804
0.424	1.432503	1.433202	1.433903	1.434604	1.435306	1.436008	1.436711	1.437415	1.438120	1.438825
0.425	1.439531	1.440238	1.440946	1.441654	1.442363	1.443073	1.443783	1.444494	1.445206	1.445919
0.426	1.446632	1.447346	1.448061	1.448777	1.449493	1.450210	1.450928	1.451646	1.452366	1.453086
0.427	1.453806	1.454528	1.455250	1.455973	1.456697	1.457422	1.458147	1.458873	1.459600	1.460328
0.428	1.461056	1.461785	1.462516	1.463246	1.463978	1.464710	1.465443	1.466177	1.466912	1.467647
0.429	1.468384	1.469121	1.469859	1.470598	1.471337	1.472077	1.472818	1.473560	1.474303	1.475047
0.430	1.475791	1.476536	1.477282	1.478029	1.478777	1.479525	1.480275	1.481025	1.481776	1.482527
0.431	1.483280	1.484034	1.484788	1.485543	1.486299	1.487056	1.487814	1.488572	1.489332	1.490092
0.432	1.490853	1.491615	1.492378	1.493142	1.493907	1.494672	1.495439	1.496206	1.496974	1.497743
0.433	1.498513	1.499284	1.500056	1.500828	1.501602	1.502376	1.503151	1.503928	1.504705	1.505483
0.434	1.506262	1.507042	1.507822	1.508604	1.509387	1.510170	1.510955	1.511740	1.512526	1.513314
0.435	1.514102	1.514891	1.515681	1.516472	1.517264	1.518057	1.518851	1.519646	1.520442	1.521238
0.436	1.522036	1.522835	1.523635	1.524435	1.525237	1.526040	1.526843	1.527648	1.528453	1.529260
0.437	1.530068	1.530876	1.531686	1.532496	1.533308	1.534121	1.534934	1.535749	1.536564	1.537381
0.438	1.538199	1.539018	1.539837	1.540658	1.541480	1.542303	1.543127	1.543952	1.544778	1.545605
0.439	1.546433	1.547262	1.548093	1.548924	1.549756	1.550590	1.551424	1.552260	1.553097	1.553935
0.440	1.554774	1.555614	1.556455	1.557297	1.558140	1.558985	1.559830	1.560677	1.561525	1.562374
0.441	1.563224	1.564075	1.564927	1.565781	1.566635	1.567491	1.568348	1.569206	1.570065	1.570925
0.442	1.571787	1.572649	1.573513	1.574378	1.575245	1.576112	1.576981	1.577850	1.578721	1.579593
0.443	1.580467	1.581341	1.582217	1.583094	1.583972	1.584852	1.585733	1.586614	1.587498	1.588382
0.444	1.589268	1.590154	1.591043	1.591932	1.592823	1.593714	1.594608	1.595502	1.596398	1.597295
0.445	1.598193	1.599093	1.599994	1.600896	1.601799	1.602704	1.603610	1.604518	1.605426	1.606336
0.446	1.607248	1.608161	1.609075	1.609990	1.610907	1.611825	1.612745	1.613666	1.614588	1.615511
0.447	1.616436	1.617363	1.618291	1.619220	1.620150	1.621082	1.622016	1.622950	1.623887	1.624824
0.448	1.625763	1.626704	1.627646	1.628589	1.629534	1.630480	1.631428	1.632377	1.633328	1.634280
0.449	1.635234	1.636189	1.637146	1.638104	1.639064	1.640025	1.640988	1.641952	1.642918	1.643885
0.450	1.644854	1.645824	1.646796	1.647769	1.648744	1.649721	1.650699	1.651679	1.652660	1.653643
0.451	1.654628	1.655614	1.656602	1.657591	1.658582	1.659575	1.660569	1.661565	1.662563	1.663562
0.452	1.664563	1.665565	1.666570	1.667576	1.668583	1.669593	1.670604	1.671616	1.672631	1.673647
0.453	1.674665	1.675685	1.676706	1.677729	1.678754	1.679781	1.680809	1.681839	1.682871	1.683905
0.454	1.684941	1.685978	1.687017	1.688058	1.689101	1.690146	1.691193	1.692241	1.693291	1.694344
0.455	1.695398	1.696454	1.697511	1.698571	1.699633	1.700696	1.701762	1.702829	1.703899	1.704970
0.456	1.706043	1.707119	1.708196	1.709275	1.710356	1.711440	1.712525	1.713612	1.714701	1.715793
0.457	1.716886	1.717981	1.719079	1.720178	1.721280	1.722384	1.723490	1.724598	1.725708	1.726820
0.458	1.727934	1.729051	1.730169	1.731290	1.732413	1.733539	1.734666	1.735796	1.736927	1.738061
0.459	1.739198	1.740336	1.741477	1.742620	1.743765	1.744913	1.746063	1.747215	1.748370	1.749527
0.460	1.750686	1.751848	1.753012	1.754178	1.755347	1.756518	1.757692	1.758868	1.760046	1.761227
0.461	1.762410	1.763596	1.764784	1.765975	1.767169	1.768364	1.769563	1.770764	1.771967	1.773173
0.462	1.774382	1.775593	1.776807	1.778023	1.779243	1.780464	1.781689	1.782916	1.784146	1.785378
0.463	1.786613	1.787851	1.789092	1.790335	1.791582	1.792831	1.794083	1.795337	1.796595	1.797855
0.464	1.799118	1.800384	1.801653	1.802925	1.804200	1.805477	1.806758	1.808042	1.809328	1.810618
0.465	1.811911	1.813206	1.814505	1.815807	1.817112	1.818420	1.819731	1.821045	1.822363	1.823683
0.466	1.825007	1.826334	1.827664	1.828997	1.830334	1.831674	1.833017	1.834364	1.835714	1.837067
0.467	1.838424	1.839784	1.841147	1.842514	1.843884	1.845258	1.846635	1.848016	1.849401	1.850788
0.468	1.852180	1.853575	1.854974	1.856376	1.857782	1.859191	1.860605	1.862022	1.863443	1.864867
0.469	1.866296	1.867728	1.869164	1.870604	1.872048	1.873495	1.874947	1.876403	1.877862	1.879326
0.470	1.880794	1.882265	1.883741	1.885221	1.886705	1.888193	1.889686	1.891182	1.892683	1.894188

	0.0000	0.0001	0.0002	0.0003	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009
0.471	1.895698	1.897212	1.898730	1.900252	1.901779	1.903311	1.904847	1.906387	1.907932	1.909482
0.472	1.911036	1.912594	1.914158	1.915726	1.917299	1.918876	1.920459	1.922046	1.923638	1.925235
0.473	1.926837	1.928443	1.930055	1.931672	1.933294	1.934921	1.936553	1.938190	1.939833	1.941481
0.474	1.943134	1.944792	1.946456	1.948125	1.949800	1.951480	1.953165	1.954857	1.956553	1.958256
0.475	1.959964	1.961678	1.963398	1.965123	1.966854	1.968592	1.970335	1.972084	1.973839	1.975601
0.476	1.977368	1.979142	1.980922	1.982708	1.984501	1.986300	1.988106	1.989918	1.991736	1.993561
0.477	1.995393	1.997232	1.999077	2.000929	2.002788	2.004654	2.006527	2.008408	2.010295	2.012189
0.478	2.014091	2.016000	2.017916	2.019840	2.021771	2.023710	2.025656	2.027611	2.029573	2.031542
0.479	2.033520	2.035506	2.037500	2.039502	2.041512	2.043530	2.045557	2.047592	2.049636	2.051688
0.480	2.053749	2.055819	2.057897	2.059985	2.062081	2.064187	2.066302	2.068426	2.070559	2.072702
0.481	2.074855	2.077017	2.079189	2.081371	2.083562	2.085764	2.087976	2.090198	2.092431	2.094674
0.482	2.096927	2.099192	2.101467	2.103753	2.106050	2.108358	2.110678	2.113009	2.115352	2.117706
0.483	2.120072	2.122450	2.124840	2.127242	2.129656	2.132083	2.134523	2.136975	2.139441	2.141919
0.484	2.144411	2.146916	2.149434	2.151966	2.154513	2.157073	2.159647	2.162236	2.164839	2.167457
0.485	2.170090	2.172739	2.175402	2.178081	2.180776	2.183487	2.186213	2.188957	2.191716	2.194493
0.486	2.197286	2.200097	2.202925	2.205772	2.208636	2.211518	2.214419	2.217338	2.220277	2.223234
0.487	2.226212	2.229209	2.232226	2.235264	2.238323	2.241403	2.244504	2.247627	2.250772	2.253939
0.488	2.257129	2.260343	2.263579	2.266840	2.270125	2.273435	2.276769	2.280130	2.283516	2.286928
0.489	2.290368	2.293835	2.297329	2.300852	2.304404	2.307984	2.311595	2.315236	2.318908	2.322612
0.490	2.326348	2.330116	2.333918	2.337754	2.341625	2.345531	2.349473	2.353452	2.357469	2.361524
0.491	2.365618	2.369752	2.373928	2.378145	2.382404	2.386708	2.391056	2.395450	2.399890	2.404378
0.492	2.408916	2.413503	2.418142	2.422833	2.427578	2.432379	2.437236	2.442152	2.447127	2.452164
0.493	2.457263	2.462428	2.467658	2.472958	2.478327	2.483769	2.489286	2.494879	2.500552	2.506306
0.494	2.512144	2.518070	2.524085	2.530192	2.536396	2.542699	2.549104	2.555616	2.562238	2.568974
0.495	2.575829	2.582807	2.589914	2.597153	2.604531	2.612054	2.619728	2.627559	2.635554	2.643722
0.496	2.652070	2.660607	2.669342	2.678286	2.687449	2.696844	2.706483	2.716381	2.726551	2.737012
0.497	2.747781	2.758879	2.770327	2.782150	2.794376	2.807034	2.820158	2.833787	2.847963	2.862736
0.498	2.878162	2.894304	2.911238	2.929050	2.947843	2.967738	2.988882	3.011454	3.035672	3.061814
0.499	3.090232	3.121389	3.155907	3.194651	3.238880	3.290527	3.352795	3.431614	3.540084	3.719016