



**DIPLOMA PROGRAMME**

**MATHEMATICS SL**

**INFORMATION BOOKLET**

For use by teachers and students, during the course and in the examinations

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# Formulae

## Presumed knowledge

|  |  |
|--|--|
| Area of a parallelogram  | $A = (b \times h)$ , where $b$ is the base, $h$ is the height                            |
| Area of a triangle   | $A = \frac{1}{2}(b \times h)$ , where $b$ is the base, $h$ is the height                 |
| Area of a trapezium  | $A = \frac{1}{2}(a + b)h$ , where $a$ and $b$ are the parallel sides, $h$ is the height  |
| Area of a circle   | $A = \pi r^2$ , where $r$ is the radius  |
| Circumference of a circle  | $C = 2\pi r$ , where $r$ is the radius   |
| Volume of a pyramid  | $V = \frac{1}{3}(\text{area of base} \times \text{vertical height})$                     |
| Volume of a cuboid   | $V = l \times w \times h$ , where $l$ is the length, $w$ is the width, $h$ is the height |
| Volume of a cylinder   | $V = \pi r^2 h$ , where $r$ is the radius, $h$ is the height                             |
| Area of the curved surface of a cylinder   | $A = 2\pi r h$ , where $r$ is the radius, $h$ is the height                              |
| Volume of a sphere   | $V = \frac{4}{3}\pi r^3$ , where $r$ is the radius                                       |
| Volume of a cone   | $V = \frac{1}{3}\pi r^2 h$ , where $r$ is the radius, $h$ is the height                  |
| Distance between two points $(x_1, y_1)$ and $(x_2, y_2)$                                  | $d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$   |
| Coordinates of the midpoint of a line segment with endpoints $(x_1, y_1)$ and $(x_2, y_2)$ | $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$                                  |

## Topic 1 – Algebra

|     |   |  |
|-----|---|--|
| 1.1 | The $n^{\text{th}}$ term of an arithmetic sequence  | $u_n = u_1 + (n-1)d$   |
|     | The sum of $n$ terms of an arithmetic sequence      | $S_n = \frac{n}{2}(2u_1 + (n-1)d) = \frac{n}{2}(u_1 + u_n)$  |
|     | The $n^{\text{th}}$ term of a geometric sequence    | $u_n = u_1 r^{n-1}$  |
|     | The sum of $n$ terms of a finite geometric sequence | $S_n = \frac{u_1(r^n - 1)}{r - 1} = \frac{u_1(1 - r^n)}{1 - r}, r \neq 1$  |
|     | The sum of an infinite geometric sequence           | $S = \frac{u_1}{1 - r},  r  < 1$   |
| 1.2 | Exponents and logarithms                            | $a^x = b \Leftrightarrow x = \log_a b$<br>$a^x = e^{x \ln a}$<br>$\log_a a^x = x = a^{\log_a x}$<br>$\log_b a = \frac{\log_c a}{\log_c b}$ |
| 1.3 | Binomial theorem                                    | $(a + b)^n = a^n + \binom{n}{1} a^{n-1} b + \dots + \binom{n}{r} a^{n-r} b^r + \dots + b^n$  |

## Topic 2 – Functions and equations

|     |   |  |
|-----|---|--|
| 2.5 | Axis of symmetry of graph of a quadratic function | $f(x) = ax^2 + bx + c \Rightarrow$ axis of symmetry $x = -\frac{b}{2a}$          |
| 2.6 | Solution of a quadratic equation                  | $ax^2 + bx + c = 0 \Rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}, a \neq 0$ |
|     | Discriminant                                      | $\Delta = b^2 - 4ac$   |

## Topic 3—Circular functions and trigonometry

|     |  |   |
|-----|--|---|
| 3.1 | Length of an arc<br>Area of a sector                   | $l = \theta r$ , where $\theta$ is the angle measured in radians, $r$ is the radius<br>$A = \frac{1}{2}\theta r^2$ , where $\theta$ is the angle measured in radians, $r$ is the radius   |
| 3.2 | Identities   | $\tan \theta = \frac{\sin \theta}{\cos \theta}$<br>$\cos^2 \theta + \sin^2 \theta = 1$  |
| 3.3 | Double angle formulae                                  | $\sin 2\theta = 2 \sin \theta \cos \theta$<br>$\cos 2\theta = \cos^2 \theta - \sin^2 \theta = 2 \cos^2 \theta - 1 = 1 - 2 \sin^2 \theta$  |
| 3.6 | Cosine rule<br><br>Sine rule<br><br>Area of a triangle | $c^2 = a^2 + b^2 - 2ab \cos C$ ; $\cos C = \frac{a^2 + b^2 - c^2}{2ab}$<br>$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$<br>$A = \frac{1}{2}ab \sin C$ , where $a$ and $b$ are adjacent sides, $C$ is the included angle |

## Topic 4—Matrices

|     |  |  |
|-----|--|--|
| 4.3 | Determinant of a $2 \times 2$ matrix<br><br>Inverse of a $2 \times 2$ matrix<br><br>Determinant of a $3 \times 3$ matrix | $A = \begin{pmatrix} a & b \\ c & d \end{pmatrix} \Rightarrow \det A = ad - bc$<br>$A = \begin{pmatrix} a & b \\ c & d \end{pmatrix} \Rightarrow A^{-1} = \frac{1}{ad - bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix}, ad \neq bc$<br>$A = \begin{pmatrix} a & b & c \\ d & e & f \\ g & h & k \end{pmatrix} \Rightarrow \det A = a \begin{vmatrix} e & f \\ h & k \end{vmatrix} - b \begin{vmatrix} d & f \\ g & k \end{vmatrix} + c \begin{vmatrix} d & e \\ g & h \end{vmatrix}$ |
|-----|--|--|

## Topic 5—Vectors

|                   |  |  |
|-------------------|--|--|
| <p><b>5.1</b></p> | <p>Magnitude of a vector</p><br><p>Distance between two points <math>(x_1, y_1, z_1)</math> and <math>(x_2, y_2, z_2)</math></p><br><p>Coordinates of the midpoint of a line segment with endpoints <math>(x_1, y_1, z_1)</math>, <math>(x_2, y_2, z_2)</math></p> | $ \mathbf{v}  = \sqrt{v_1^2 + v_2^2 + v_3^2}, \text{ where } \mathbf{v} = \begin{pmatrix} v_1 \\ v_2 \\ v_3 \end{pmatrix}$<br>$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2}$<br>$\left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}, \frac{z_1 + z_2}{2} \right)$   |
| <p><b>5.2</b></p> | <p>Scalar product</p><br><br><br><p>Angle between two vectors</p>  | <p><math>\mathbf{v} \cdot \mathbf{w} =  \mathbf{v}   \mathbf{w}  \cos \theta</math>, where <math>\theta</math> is the angle between <math>\mathbf{v}</math> and <math>\mathbf{w}</math></p><br>$\mathbf{v} \cdot \mathbf{w} = v_1 w_1 + v_2 w_2 + v_3 w_3, \text{ where } \mathbf{v} = \begin{pmatrix} v_1 \\ v_2 \\ v_3 \end{pmatrix}, \mathbf{w} = \begin{pmatrix} w_1 \\ w_2 \\ w_3 \end{pmatrix}$<br>$\cos \theta = \frac{v_1 w_1 + v_2 w_2 + v_3 w_3}{ \mathbf{v}   \mathbf{w} }$ |
| <p><b>5.3</b></p> | <p>Vector representation (equation) of a line</p>  | $\mathbf{r} = \mathbf{a} + t\mathbf{b}$  |

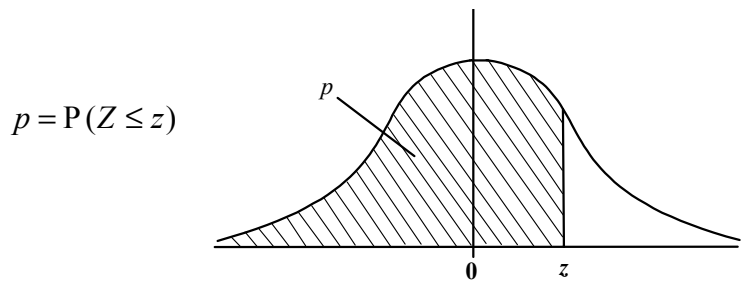
## Topic 6—Statistics and probability

|  |  |   |
|--|--|---|
| <p><b>6.3</b></p> <p><b>Population parameters</b></p> <p>Mean</p> <p>Variance <math>\sigma^2</math></p> <p>Standard deviation <math>\sigma</math></p> <p><b>Sample statistics</b></p> <p>Mean <math>\bar{x}</math></p> <p>Variance <math>s_n^2</math></p> <p>Standard deviation <math>s_n</math></p> |  | <p>Let <math>n = \sum_{i=1}^k f_i</math>.</p> $\bar{x} = \frac{\sum_{i=1}^k f_i x_i}{n}$ $\sigma^2 = \frac{\sum_{i=1}^k f_i (x_i - \bar{x})^2}{n}$ $\sigma = \sqrt{\frac{\sum_{i=1}^k f_i (x_i - \bar{x})^2}{n}}$ $\bar{x} = \frac{\sum_{i=1}^k f_i x_i}{n}$ $s_n^2 = \frac{\sum_{i=1}^k f_i (x_i - \bar{x})^2}{n}$ $s_n = \sqrt{\frac{\sum_{i=1}^k f_i (x_i - \bar{x})^2}{n}}$ |
| <p><b>6.5</b></p> <p>Probability of an event <math>A</math></p> <p>Complementary events</p>  |  | $P(A) = \frac{n(A)}{n(U)}$ $P(A) + P(A') = 1$   |
| <p><b>6.6</b></p> <p>Combined events</p> <p>Mutually exclusive events</p>  |  | $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $P(A \cup B) = P(A) + P(B)$   |
| <p><b>6.7</b></p> <p>Conditional probability</p> <p>Independent events</p>   |  | $P(A B) = \frac{P(A \cap B)}{P(B)}$ $P(A \cap B) = P(A) P(B)$   |
| <p><b>6.9</b></p> <p>Expected value of a discrete random variable <math>X</math></p>   |  | $E(X) = \sum_x x P(X = x)$  |
| <p><b>6.10</b></p> <p>Binomial distribution</p> <p>Mean</p>  |  | $X \sim B(n, p) \Rightarrow P(X = r) = \binom{n}{r} p^r (1-p)^{n-r}, r = 0, 1, \dots, n$ $E(X) = np$  |
| <p><b>6.11</b></p> <p>Standardized normal variable</p>   |  | $z = \frac{x - \bar{x}}{\sigma}$  |

## Topic 7—Calculus

|     |                                 |  |
|-----|---------------------------------|--|
| 7.1 | Derivative of $f(x)$            | $y = f(x) \Rightarrow \frac{dy}{dx} = f'(x) = \lim_{h \rightarrow 0} \left( \frac{f(x+h) - f(x)}{h} \right)$ |
|     | Derivative of $x^n$             | $f(x) = x^n \Rightarrow f'(x) = nx^{n-1}$  |
|     | Derivative of $\sin x$          | $f(x) = \sin x \Rightarrow f'(x) = \cos x$   |
|     | Derivative of $\cos x$          | $f(x) = \cos x \Rightarrow f'(x) = -\sin x$  |
|     | Derivative of $\tan x$          | $f(x) = \tan x \Rightarrow f'(x) = \frac{1}{\cos^2 x}$   |
|     | Derivative of $e^x$             | $f(x) = e^x \Rightarrow f'(x) = e^x$   |
|     | Derivative of $\ln x$           | $f(x) = \ln x \Rightarrow f'(x) = \frac{1}{x}$   |
| 7.2 | Chain rule                      | $y = g(u)$ , where $u = f(x) \Rightarrow \frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$                 |
|     | Product rule                    | $y = uv \Rightarrow \frac{dy}{dx} = u \frac{dv}{dx} + v \frac{du}{dx}$                                       |
|     | Quotient rule                   | $y = \frac{u}{v} \Rightarrow \frac{dy}{dx} = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$                  |
| 7.4 | Standard integrals              | $\int x^n dx = \frac{x^{n+1}}{n+1} + C, \quad n \neq -1$   |
|     |                                 | $\int \frac{1}{x} dx = \ln x + C, \quad x > 0$   |
|     |                                 | $\int \sin x dx = -\cos x + C$   |
|     |                                 | $\int \cos x dx = \sin x + C$  |
|     |                                 | $\int e^x dx = e^x + C$  |
| 7.5 | Area under a curve              | $A = \int_a^b y dx$  |
|     | Volume of revolution (rotation) | $V = \int_a^b \pi y^2 dx$  |

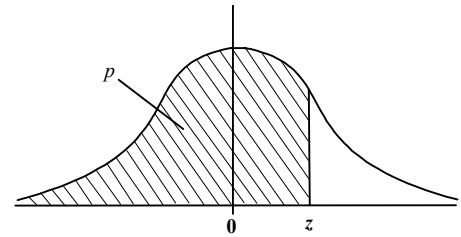
# Area under the standard normal curve (topic 6.1 I)



| <i>z</i> | 0      | 0.01   | 0.02   | 0.03   | 0.04   | 0.05   | 0.06   | 0.07   | 0.08   | 0.09   |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.0      | 0.5000 | 0.5040 | 0.5080 | 0.5120 | 0.5160 | 0.5199 | 0.5239 | 0.5279 | 0.5319 | 0.5359 |
| 0.1      | 0.5398 | 0.5438 | 0.5478 | 0.5517 | 0.5557 | 0.5596 | 0.5636 | 0.5675 | 0.5714 | 0.5753 |
| 0.2      | 0.5793 | 0.5832 | 0.5871 | 0.5910 | 0.5948 | 0.5987 | 0.6026 | 0.6064 | 0.6103 | 0.6141 |
| 0.3      | 0.6179 | 0.6217 | 0.6255 | 0.6293 | 0.6331 | 0.6368 | 0.6406 | 0.6443 | 0.6480 | 0.6517 |
| 0.4      | 0.6554 | 0.6591 | 0.6628 | 0.6664 | 0.6700 | 0.6736 | 0.6772 | 0.6808 | 0.6844 | 0.6879 |
| 0.5      | 0.6915 | 0.6950 | 0.6985 | 0.7019 | 0.7054 | 0.7088 | 0.7123 | 0.7157 | 0.7190 | 0.7224 |
| 0.6      | 0.7257 | 0.7291 | 0.7324 | 0.7357 | 0.7389 | 0.7422 | 0.7454 | 0.7486 | 0.7517 | 0.7549 |
| 0.7      | 0.7580 | 0.7611 | 0.7642 | 0.7673 | 0.7704 | 0.7734 | 0.7764 | 0.7794 | 0.7823 | 0.7852 |
| 0.8      | 0.7881 | 0.7910 | 0.7939 | 0.7967 | 0.7995 | 0.8023 | 0.8051 | 0.8079 | 0.8106 | 0.8133 |
| 0.9      | 0.8159 | 0.8186 | 0.8212 | 0.8238 | 0.8264 | 0.8289 | 0.8315 | 0.8340 | 0.8365 | 0.8389 |
| 1.0      | 0.8413 | 0.8438 | 0.8461 | 0.8485 | 0.8508 | 0.8531 | 0.8554 | 0.8577 | 0.8599 | 0.8621 |
| 1.1      | 0.8643 | 0.8665 | 0.8686 | 0.8708 | 0.8729 | 0.8749 | 0.8770 | 0.8790 | 0.8810 | 0.8830 |
| 1.2      | 0.8849 | 0.8869 | 0.8888 | 0.8907 | 0.8925 | 0.8944 | 0.8962 | 0.8980 | 0.8997 | 0.9015 |
| 1.3      | 0.9032 | 0.9049 | 0.9066 | 0.9082 | 0.9099 | 0.9115 | 0.9131 | 0.9147 | 0.9162 | 0.9177 |
| 1.4      | 0.9192 | 0.9207 | 0.9222 | 0.9236 | 0.9251 | 0.9265 | 0.9279 | 0.9292 | 0.9306 | 0.9319 |
| 1.5      | 0.9332 | 0.9345 | 0.9357 | 0.9370 | 0.9382 | 0.9394 | 0.9406 | 0.9418 | 0.9429 | 0.9441 |
| 1.6      | 0.9452 | 0.9463 | 0.9474 | 0.9484 | 0.9495 | 0.9505 | 0.9515 | 0.9525 | 0.9535 | 0.9545 |
| 1.7      | 0.9554 | 0.9564 | 0.9573 | 0.9582 | 0.9591 | 0.9599 | 0.9608 | 0.9616 | 0.9625 | 0.9633 |
| 1.8      | 0.9641 | 0.9649 | 0.9656 | 0.9664 | 0.9671 | 0.9678 | 0.9686 | 0.9693 | 0.9699 | 0.9706 |
| 1.9      | 0.9713 | 0.9719 | 0.9726 | 0.9732 | 0.9738 | 0.9744 | 0.9750 | 0.9756 | 0.9761 | 0.9767 |
| 2.0      | 0.9773 | 0.9778 | 0.9783 | 0.9788 | 0.9793 | 0.9798 | 0.9803 | 0.9808 | 0.9812 | 0.9817 |
| 2.1      | 0.9821 | 0.9826 | 0.9830 | 0.9834 | 0.9838 | 0.9842 | 0.9846 | 0.9850 | 0.9854 | 0.9857 |
| 2.2      | 0.9861 | 0.9864 | 0.9868 | 0.9871 | 0.9875 | 0.9878 | 0.9881 | 0.9884 | 0.9887 | 0.9890 |
| 2.3      | 0.9892 | 0.9896 | 0.9898 | 0.9901 | 0.9904 | 0.9906 | 0.9909 | 0.9911 | 0.9913 | 0.9916 |
| 2.4      | 0.9918 | 0.9920 | 0.9922 | 0.9925 | 0.9927 | 0.9929 | 0.9931 | 0.9932 | 0.9934 | 0.9936 |
| 2.5      | 0.9938 | 0.9940 | 0.9941 | 0.9943 | 0.9945 | 0.9946 | 0.9948 | 0.9949 | 0.9951 | 0.9952 |
| 2.6      | 0.9953 | 0.9955 | 0.9956 | 0.9957 | 0.9959 | 0.9960 | 0.9961 | 0.9962 | 0.9963 | 0.9964 |
| 2.7      | 0.9965 | 0.9966 | 0.9967 | 0.9968 | 0.9969 | 0.9970 | 0.9971 | 0.9972 | 0.9973 | 0.9974 |
| 2.8      | 0.9974 | 0.9975 | 0.9976 | 0.9977 | 0.9977 | 0.9978 | 0.9979 | 0.9979 | 0.9980 | 0.9981 |
| 2.9      | 0.9981 | 0.9982 | 0.9983 | 0.9983 | 0.9984 | 0.9984 | 0.9985 | 0.9985 | 0.9986 | 0.9986 |
| 3.0      | 0.9987 | 0.9987 | 0.9988 | 0.9988 | 0.9988 | 0.9989 | 0.9989 | 0.9989 | 0.9990 | 0.9990 |
| 3.1      | 0.9990 | 0.9991 | 0.9991 | 0.9991 | 0.9992 | 0.9992 | 0.9992 | 0.9992 | 0.9993 | 0.9993 |
| 3.2      | 0.9993 | 0.9993 | 0.9994 | 0.9994 | 0.9994 | 0.9994 | 0.9994 | 0.9995 | 0.9995 | 0.9995 |
| 3.3      | 0.9995 | 0.9995 | 0.9996 | 0.9996 | 0.9996 | 0.9996 | 0.9996 | 0.9996 | 0.9996 | 0.9997 |
| 3.4      | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9998 |
| 3.5      | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 |

# Inverse normal probabilities (topic 6.1 I)

$$p = P(Z \leq z)$$



| $p$  | 0      | 0.001  | 0.002  | 0.003  | 0.004  | 0.005  | 0.006  | 0.007  | 0.008  | 0.009  |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.50 | 0.0000 | 0.0025 | 0.0050 | 0.0075 | 0.0100 | 0.0125 | 0.0150 | 0.0176 | 0.0201 | 0.0226 |
| 0.51 | 0.0251 | 0.0276 | 0.0301 | 0.0326 | 0.0351 | 0.0376 | 0.0401 | 0.0426 | 0.0451 | 0.0476 |
| 0.52 | 0.0502 | 0.0527 | 0.0552 | 0.0577 | 0.0602 | 0.0627 | 0.0652 | 0.0677 | 0.0702 | 0.0728 |
| 0.53 | 0.0753 | 0.0778 | 0.0803 | 0.0828 | 0.0853 | 0.0878 | 0.0904 | 0.0929 | 0.0954 | 0.0979 |
| 0.54 | 0.1004 | 0.1030 | 0.1055 | 0.1080 | 0.1105 | 0.1130 | 0.1156 | 0.1181 | 0.1206 | 0.1231 |
| 0.55 | 0.1257 | 0.1282 | 0.1307 | 0.1332 | 0.1358 | 0.1383 | 0.1408 | 0.1434 | 0.1459 | 0.1484 |
| 0.56 | 0.1510 | 0.1535 | 0.1560 | 0.1586 | 0.1611 | 0.1637 | 0.1662 | 0.1687 | 0.1713 | 0.1738 |
| 0.57 | 0.1764 | 0.1789 | 0.1815 | 0.1840 | 0.1866 | 0.1891 | 0.1917 | 0.1942 | 0.1968 | 0.1993 |
| 0.58 | 0.2019 | 0.2045 | 0.2070 | 0.2096 | 0.2121 | 0.2147 | 0.2173 | 0.2198 | 0.2224 | 0.2250 |
| 0.59 | 0.2275 | 0.2301 | 0.2327 | 0.2353 | 0.2379 | 0.2404 | 0.2430 | 0.2456 | 0.2482 | 0.2508 |
| 0.60 | 0.2534 | 0.2559 | 0.2585 | 0.2611 | 0.2637 | 0.2663 | 0.2689 | 0.2715 | 0.2741 | 0.2767 |
| 0.61 | 0.2793 | 0.2819 | 0.2845 | 0.2872 | 0.2898 | 0.2924 | 0.2950 | 0.2976 | 0.3002 | 0.3029 |
| 0.62 | 0.3055 | 0.3081 | 0.3107 | 0.3134 | 0.3160 | 0.3186 | 0.3213 | 0.3239 | 0.3266 | 0.3292 |
| 0.63 | 0.3319 | 0.3345 | 0.3372 | 0.3398 | 0.3425 | 0.3451 | 0.3478 | 0.3505 | 0.3531 | 0.3558 |
| 0.64 | 0.3585 | 0.3611 | 0.3638 | 0.3665 | 0.3692 | 0.3719 | 0.3745 | 0.3772 | 0.3799 | 0.3826 |
| 0.65 | 0.3853 | 0.3880 | 0.3907 | 0.3934 | 0.3961 | 0.3989 | 0.4016 | 0.4043 | 0.4070 | 0.4097 |
| 0.66 | 0.4125 | 0.4152 | 0.4179 | 0.4207 | 0.4234 | 0.4262 | 0.4289 | 0.4316 | 0.4344 | 0.4372 |
| 0.67 | 0.4399 | 0.4427 | 0.4454 | 0.4482 | 0.4510 | 0.4538 | 0.4565 | 0.4593 | 0.4621 | 0.4649 |
| 0.68 | 0.4677 | 0.4705 | 0.4733 | 0.4761 | 0.4789 | 0.4817 | 0.4845 | 0.4874 | 0.4902 | 0.4930 |
| 0.69 | 0.4959 | 0.4987 | 0.5015 | 0.5044 | 0.5072 | 0.5101 | 0.5129 | 0.5158 | 0.5187 | 0.5215 |
| 0.70 | 0.5244 | 0.5273 | 0.5302 | 0.5331 | 0.5359 | 0.5388 | 0.5417 | 0.5446 | 0.5476 | 0.5505 |
| 0.71 | 0.5534 | 0.5563 | 0.5592 | 0.5622 | 0.5651 | 0.5681 | 0.5710 | 0.5740 | 0.5769 | 0.5799 |
| 0.72 | 0.5828 | 0.5858 | 0.5888 | 0.5918 | 0.5948 | 0.5978 | 0.6008 | 0.6038 | 0.6068 | 0.6098 |
| 0.73 | 0.6128 | 0.6158 | 0.6189 | 0.6219 | 0.6250 | 0.6280 | 0.6311 | 0.6341 | 0.6372 | 0.6403 |
| 0.74 | 0.6434 | 0.6464 | 0.6495 | 0.6526 | 0.6557 | 0.6588 | 0.6620 | 0.6651 | 0.6682 | 0.6714 |
| 0.75 | 0.6745 | 0.6776 | 0.6808 | 0.6840 | 0.6871 | 0.6903 | 0.6935 | 0.6967 | 0.6999 | 0.7031 |

## Inverse normal probabilities (topic 6.11, continued)

| $p$  | 0      | 0.001  | 0.002  | 0.003  | 0.004  | 0.005  | 0.006  | 0.007  | 0.008  | 0.009  |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.76 | 0.7063 | 0.7095 | 0.7128 | 0.7160 | 0.7192 | 0.7225 | 0.7257 | 0.7290 | 0.7323 | 0.7356 |
| 0.77 | 0.7389 | 0.7421 | 0.7455 | 0.7488 | 0.7521 | 0.7554 | 0.7588 | 0.7621 | 0.7655 | 0.7688 |
| 0.78 | 0.7722 | 0.7756 | 0.7790 | 0.7824 | 0.7858 | 0.7892 | 0.7926 | 0.7961 | 0.7995 | 0.8030 |
| 0.79 | 0.8064 | 0.8099 | 0.8134 | 0.8169 | 0.8204 | 0.8239 | 0.8274 | 0.8310 | 0.8345 | 0.8381 |
| 0.80 | 0.8416 | 0.8452 | 0.8488 | 0.8524 | 0.8560 | 0.8596 | 0.8633 | 0.8669 | 0.8706 | 0.8742 |
| 0.81 | 0.8779 | 0.8816 | 0.8853 | 0.8890 | 0.8927 | 0.8965 | 0.9002 | 0.9040 | 0.9078 | 0.9116 |
| 0.82 | 0.9154 | 0.9192 | 0.9230 | 0.9269 | 0.9307 | 0.9346 | 0.9385 | 0.9424 | 0.9463 | 0.9502 |
| 0.83 | 0.9542 | 0.9581 | 0.9621 | 0.9661 | 0.9701 | 0.9741 | 0.9782 | 0.9822 | 0.9863 | 0.9904 |
| 0.84 | 0.9945 | 0.9986 | 1.0027 | 1.0069 | 1.0110 | 1.0152 | 1.0194 | 1.0237 | 1.0279 | 1.0322 |
| 0.85 | 1.0364 | 1.0407 | 1.0451 | 1.0494 | 1.0537 | 1.0581 | 1.0625 | 1.0669 | 1.0714 | 1.0758 |
| 0.86 | 1.0803 | 1.0848 | 1.0894 | 1.0939 | 1.0985 | 1.1031 | 1.1077 | 1.1123 | 1.1170 | 1.1217 |
| 0.87 | 1.1264 | 1.1311 | 1.1359 | 1.1407 | 1.1455 | 1.1504 | 1.1552 | 1.1601 | 1.1651 | 1.1700 |
| 0.88 | 1.1750 | 1.1800 | 1.1850 | 1.1901 | 1.1952 | 1.2004 | 1.2055 | 1.2107 | 1.2160 | 1.2212 |
| 0.89 | 1.2265 | 1.2319 | 1.2372 | 1.2426 | 1.2481 | 1.2536 | 1.2591 | 1.2646 | 1.2702 | 1.2759 |
| 0.90 | 1.2816 | 1.2873 | 1.2930 | 1.2988 | 1.3047 | 1.3106 | 1.3165 | 1.3225 | 1.3285 | 1.3346 |
| 0.91 | 1.3408 | 1.3469 | 1.3532 | 1.3595 | 1.3658 | 1.3722 | 1.3787 | 1.3852 | 1.3917 | 1.3984 |
| 0.92 | 1.4051 | 1.4118 | 1.4187 | 1.4255 | 1.4325 | 1.4395 | 1.4466 | 1.4538 | 1.4611 | 1.4684 |
| 0.93 | 1.4758 | 1.4833 | 1.4909 | 1.4985 | 1.5063 | 1.5141 | 1.5220 | 1.5301 | 1.5382 | 1.5464 |
| 0.94 | 1.5548 | 1.5632 | 1.5718 | 1.5805 | 1.5893 | 1.5982 | 1.6073 | 1.6164 | 1.6258 | 1.6352 |
| 0.95 | 1.6449 | 1.6546 | 1.6646 | 1.6747 | 1.6849 | 1.6954 | 1.7060 | 1.7169 | 1.7279 | 1.7392 |
| 0.96 | 1.7507 | 1.7624 | 1.7744 | 1.7866 | 1.7991 | 1.8119 | 1.8250 | 1.8384 | 1.8522 | 1.8663 |
| 0.97 | 1.8808 | 1.8957 | 1.9110 | 1.9268 | 1.9431 | 1.9600 | 1.9774 | 1.9954 | 2.0141 | 2.0335 |
| 0.98 | 2.0538 | 2.0749 | 2.0969 | 2.1201 | 2.1444 | 2.1701 | 2.1973 | 2.2262 | 2.2571 | 2.2904 |
| 0.99 | 2.3264 | 2.3656 | 2.4089 | 2.4573 | 2.5121 | 2.5758 | 2.6521 | 2.7478 | 2.8782 | 3.0902 |





