

MODUL PINTAS TINGKATAN LIMA

2 JAM

ARAHAN :

1. Jangan Buka Kertas Peperiksaan Ini Sehingga Diberitahu.
2. Tulis nombor kad pengenalan, angka giliran, nama, tingkatan anda pada petak yang disediakan.
3. Kertas peperiksaan ini adalah dalam dwibahasa.
4. Soalan dalam bahasa Melayu mendahului soalan yang sepadan dalam bahasa Inggeris.
5. Calon dibenarkan menjawab keseluruhan soalan atau sebahagian soalan sama ada dalam bahasa Melayu atau bahasa Inggeris.
6. Calon dikehendaki membaca maklumat di halaman belakang kertas peperiksaan ini.

Untuk Kegunaan Pemeriksa				
Kod Pemeriksa				
Bahagian	Soalan	Soalan Dijawab	Markah Penuh	Markah Diperoleh (Untuk Kegunaan Pemeriksa)
A	1		7	
	2		4	
	3		5	
	4		7	
	5		7	
	6		6	
	7		4	
	8		4	
	9		5	
	10		4	
	11		6	
	12		5	
B	13		8	
	14		8	
	15		8	
Jumlah				

NO. KAD PENGENALAN

ANGKA GILIRAN

NAMA :

TINGKATAN :

Kertas peperiksaan ini mengandungi 27 halaman bercetak dan 1 halaman tidak bercetak.

3472/1

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3472/1

MATEMATIK TAMBAHAN
Kertas 1

Rumus-rumus berikut boleh membantu anda menjawab soalan. Simbol-simbol yang diberi adalah yang biasa digunakan.

The following formulae may be helpful in answering the questions. The symbols given are the ones commonly used.

**SENARAI RUMUS
LIST OF FORMULAE**

- | | |
|--|--|
| <p>1 $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$</p> <p>2 $\log_a b = \frac{\log_c b}{\log_c a}$</p> <p>3 $T_n = a + (n - 1)d$</p> <p>4 $T_n = ar^{n-1}$</p> <p>5 $S_n = \frac{n}{2} [2a + (n - 1)d]$</p> <p>6 $S_n = \frac{a(r^n - 1)}{r - 1} = \frac{a(1 - r^n)}{1 - r}, r \neq 1$</p> <p>7 $Z = \frac{X - \mu}{\sigma}$</p> <p>8 $P(X = r) = {}^n C_r p^r q^{n-r}, p + q = 1$</p> <p>9 ${}^n P_r = \frac{n!}{(n - r)!}$</p> <p>10 ${}^n C_r = \frac{n!}{(n - r)! r!}$</p> <p>11 $I = \frac{Q_1}{Q_0} \times 100$</p> <p>12 $\bar{I} = \frac{\sum W_i I_i}{\sum W_i}$</p> <p>13 $\sin^2 A + \cos^2 A = 1$
$\sin^2 A + \cos^2 A = 1$</p> <p>14 $\sec^2 A = 1 + \tan^2 A$
$\sec^2 A = 1 + \tan^2 A$</p> | <p>15 $\operatorname{cosec}^2 A = 1 + \cot^2 A$
$\operatorname{cosec}^2 A = 1 + \cot^2 A$</p> <p>16 $\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$
$\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$</p> <p>17 $\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$
$\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$</p> <p>18 $\tan(A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$</p> <p>19 $\sin 2A = 2 \sin A \cos A$
$\sin 2A = 2 \sin A \cos A$</p> <p>20 $\cos 2A = \cos^2 A - \sin^2 A$
$= 2 \cos^2 A - 1$
$= 1 - 2 \sin^2 A$
$\cos 2A = \cos^2 A - \sin^2 A$
$= 2 \cos^2 A - 1$
$= 1 - 2 \sin^2 A$</p> <p>21 $\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$</p> <p>22 $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$</p> <p>23 $a^2 = b^2 + c^2 - 2bc \cos A$
$a^2 = b^2 + c^2 - 2bc \cos A$</p> <p>24 Luas segi tiga / Area of triangle
$= \frac{1}{2} ab \sin C$</p> |
|--|--|

Bahagian A
Section A

[64 markah]

[64 marks]

Jawab semua soalan.

Answer all questions.

1 (a) Diberi $\frac{p^2}{3} \left(\frac{3}{y^3}\right)^p \left(\frac{y}{2}\right)^{p+2} = \frac{q}{y^2}$, cari nilai bagi p dan q .

Given $\frac{p^2}{3} \left(\frac{3}{y^3}\right)^p \left(\frac{y}{2}\right)^{p+2} = \frac{q}{y^2}$, find the values of p and q .

[4 markah]

[4 marks]

(b) Nilaikan $(\log_{\sqrt{y}} 9)(\log_x y)(\log_3 x)$.

Evaluate $(\log_{\sqrt{y}} 9)(\log_x y)(\log_3 x)$.

[3 markah]

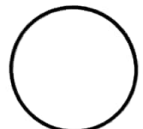
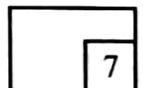
[3 marks]

Jawapan / Answer :

(a)

(b)

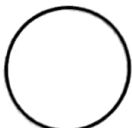
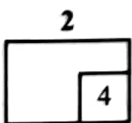
1



- 2 Selesaikan persamaan serentak $2y = 7 - x$ dan $|x + y| = 4$.
Solve the simultaneous equations $2y = 7 - x$ and $|x + y| = 4$.

[4 markah]
[4 marks]

Jawapan / Answer :



- 3 Sejak 5 tahun yang lalu, Suhaila telah menyimpan sebanyak RM15 000 di dalam akaun simpanannya dengan kadar faedah 4.5% setahun. Simpanannya itu menerima faedah kompaun setiap 6 bulan sekali bagi setiap tahun.

Since 5 years ago, Suhaila has saved RM15 000 in her savings account with an interest rate of 4.5% per annum. The savings receive compound interest every 6 months for each year.

Hitung

Calculate

- (a) jumlah simpanan Suhaila sehingga kini sekiranya beliau tidak pernah membuat sebarang penambahan simpanan atau pengeluaran,
the amount of savings of Suhaila until now if she has never made any additional savings or withdrawals,

[3 markah]

[3 marks]

- (b) jumlah faedah kompaun yang diperolehnya.
the amount of compound interest earned by her.

[2 markah]

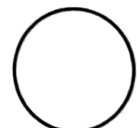
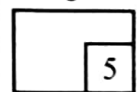
[2 marks]

Jawapan / Answer :

(a)

(b)

3



- 4 (a) Buktikan bahawa $\sin(x + 45^\circ) \sin(x - 45^\circ) = -\frac{1}{2} \cos 2x$.

Prove that $\sin(x + 45^\circ) \sin(x - 45^\circ) = -\frac{1}{2} \cos 2x$.

[3 markah]

[3 marks]

- (b) Diberi $\cos 2x = -\frac{5}{13}$ dengan keadaan $90^\circ \leq x \leq 180^\circ$, tanpa menggunakan kalkulator, cari nilai $\tan x$.

Given $\cos 2x = -\frac{5}{13}$ where $90^\circ \leq x \leq 180^\circ$, without using the calculator, find the value of $\tan x$.

[4 markah]

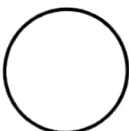
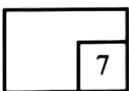
[4 marks]

Jawapan / Answer :

(a)

(b)

4



- 5 Persamaan lokus bagi titik bergerak R diberi oleh $x^2 + y^2 - 9x + y + 18 = 0$.
Tunjukkan bahawa

*The equation of locus of a moving point R is given by $x^2 + y^2 - 9x + y + 18 = 0$.
Show that*

- (a) lokus R bersilang dengan paksi- x pada dua titik berbeza,
the locus R intersects with x -axis at two different points,

[3 markah]
[3 marks]

- (b) garis lurus $y = -3x + 8$ ialah tangen kepada lokus R .
the straight line $y = -3x + 8$ is a tangent to the locus R .

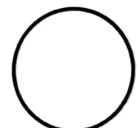
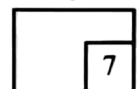
[4 markah]
[4 marks]

Jawapan / Answer :

(a)

(b)

5



- 6 (a) Fungsi songsangan h^{-1} ditakrifkan oleh $h^{-1} : x \rightarrow \frac{2}{3-x}, x \neq k$.

The inverse function h^{-1} is defined by $h^{-1} : x \rightarrow \frac{2}{3-x}, x \neq k$.

Cari

Find

- (i) nilai k ,
the value of k ,
(ii) $h(x)$.

[3 markah]

[3 marks]

- (b) Diberi bahawa $f : x \rightarrow ax + b$, $g^{-1} : x \rightarrow \frac{x+5}{2}$ dan $fg^{-1} : x \rightarrow 4 + 3x$.

Cari nilai a dan nilai b .

Given that $f : x \rightarrow ax + b$, $g^{-1} : x \rightarrow \frac{x+5}{2}$ and $fg^{-1} : x \rightarrow 4 + 3x$.

Find the value of a and of b .

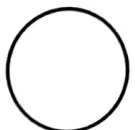
[3 markah]

[3 marks]

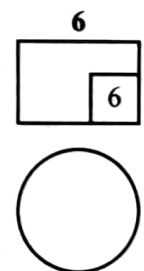
Jawapan / Answer :

(a) (i)

(ii)

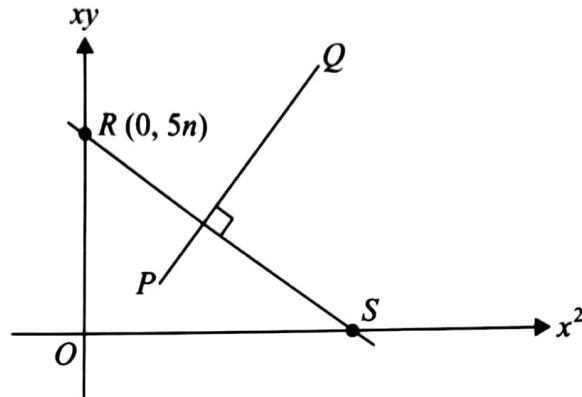


(b)



- 7 Pemboleh ubah x dan y dihubungkan oleh persamaan $2y = (m - 1)x + \frac{10}{x}$, dengan keadaan m ialah pemalar. Rajah 1 menunjukkan graf garis lurus RS yang diperoleh dengan memplot xy melawan x^2 .

The variables x and y are related by equation $2y = (m - 1)x + \frac{10}{x}$, such that m is a constant. Diagram 1 shows a straight line graph of RS obtained by plotting xy against x^2 .



Rajah 1
Diagram 1

- (a) Ungkapkan persamaan $2y = (m - 1)x + \frac{10}{x}$ dalam bentuk linear yang digunakan untuk memperoleh graf garis lurus yang ditunjukkan dalam Rajah 1.

Express the equation $2y = (m - 1)x + \frac{10}{x}$ in the linear form used to obtain the straight line graph as shown in Diagram 1.

[1 markah]
[1 mark]

- (b) Diberi kecerunan garis lurus PQ ialah $\frac{1}{3}$, cari nilai m dan nilai n .

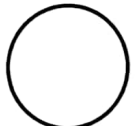
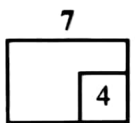
Given the gradient of the straight line PQ is $\frac{1}{3}$, find the value of m and of n .

[3 markah]
[3 marks]

Jawapan / Answer :

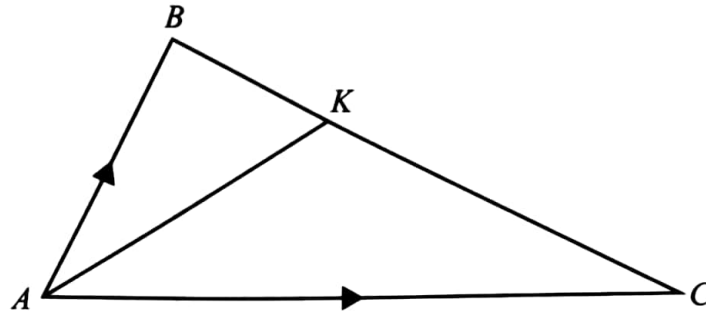
(a)

(b)



- 8 Rajah 2 menunjukkan sebuah segi tiga ABC . K ialah titik yang terletak pada garis BC dengan keadaan $BK : KC = n : 2$. Diberi bahawa $\vec{AB} = 3\underline{x}$ dan $\vec{AC} = 6\underline{y}$.

Diagram 2 shows triangle ABC . K is a point on line BC such that $BK : KC = n : 2$. Given that $\vec{AB} = 3\underline{x}$ and $\vec{AC} = 6\underline{y}$.



Rajah 2
Diagram 2

Ungkapkan vektor,
Express vector,

- (a) \vec{BC} dalam sebutan \underline{x} dan \underline{y} ,
 \vec{BC} in terms of \underline{x} and \underline{y} ,

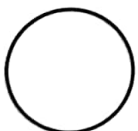
[1 markah]
[1 mark]

- (b) \vec{AK} dalam sebutan n , \underline{x} dan \underline{y} .
 \vec{AK} in terms of n , \underline{x} and \underline{y} .

[3 markah]
[3 marks]

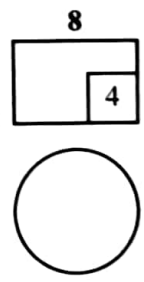
Jawapan / Answer :

- (a)

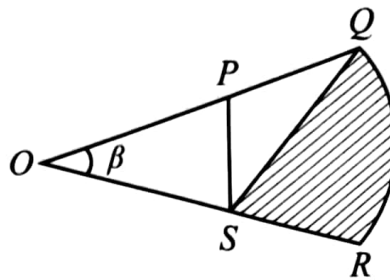


(b)

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- 9 Rajah 3 menunjukkan sebuah sektor QOR bagi bulatan dengan pusat O .
Diagram 3 shows a sector QOR of a circle with centre O .



Rajah 3
Diagram 3

Diberi panjang lengkok QR ialah 9 cm dan $OP = OS = PQ = SR = 7.5$ cm, cari
Given the length of arc QR is 9 cm and $OP = OS = PQ = SR = 7.5$ cm, find

- (a) nilai β , dalam radian,
the value of β , in radians,

[2 markah]
[2 marks]

- (b) luas kawasan berlorek, dalam cm^2 .
the area of the shaded region, in cm^2 .

[3 markah]
[3 marks]

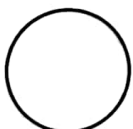
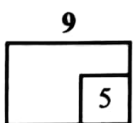
Gunakan $\pi = 3.142$.

Use $\pi = 3.142$.

Jawapan / Answer :

(a)

(b)



- 10 (a) Cari julat nilai x bagi $2x^2 + 5x \leq 3$.

Find the range of values of x for $2x^2 + 5x \leq 3$.

[2 markah]

[2 marks]

- (b) Persamaan kuadratik $px^2 + 3qx + 4 = 0$, dengan keadaan p dan q ialah pemalar, mempunyai dua punca yang sama.

Ungkapkan q dalam sebutan p .

The quadratic equation $px^2 + 3qx + 4 = 0$, where p and q are constants, has two equal roots.

Express q in terms of p .

[2 markah]

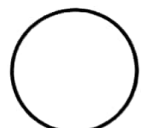
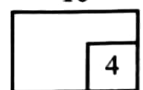
[2 marks]

Jawapan / Answer :

(a)

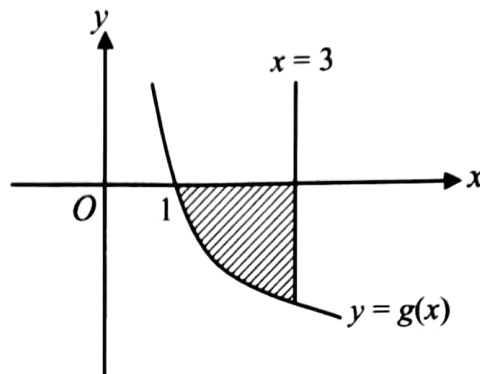
(b)

10



- 11 Rajah 4 menunjukkan rantau berlorek yang dibatasi oleh lengkung $y = g(x)$, paksi- x dan garis lurus $x = 3$.

Diagram 4 shows the shaded region bounded by the curve $y = g(x)$, the x -axis and the straight line $x = 3$.



Rajah 4
Diagram 4

Diberi bahawa luas rantau berlorek ialah 10 unit².

Given that the area of the shaded region is 10 units².

(a) Cari $\int_1^3 [x - 2g(x)] dx$.

Find $\int_1^3 [x - 2g(x)] dx$.

[3 markah]
[3 marks]

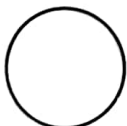
(b) Diberi $g'(x) = 2x - 8$, cari $g(x)$ dalam sebutan x .

Given $g'(x) = 2x - 8$, find $g(x)$ in terms of x .

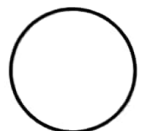
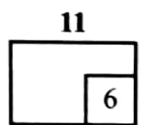
[3 markah]
[3 marks]

Jawapan / Answer :

(a)



(b)



- 12 Kebarangkalian seorang murid berbasikal ke sekolah ialah p . Suatu sampel 5 orang murid dipilih secara rawak.

The probability of a student cycles to school is p . A sample of 5 students is selected at random.

- (a) Jika kebarangkalian bagi kesemua 5 orang murid itu berbasikal ke sekolah ialah 0.16807, cari nilai p .

If the probability of all the 5 students cycle to school is 0.16807, find the value of p .

[2 markah]
[2 marks]

- (b) Cari kebarangkalian bahawa lebih daripada 3 orang murid berbasikal ke sekolah.

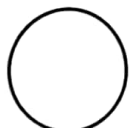
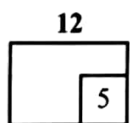
Find the probability that more than 3 students cycle to school.

[3 markah]
[3 marks]

Jawapan / Answer :

(a)

(b)



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Bahagian B
Section B

[16 markah]
[16 marks]

Jawab mana-mana **dua** soalan daripada bahagian ini.
Answer any two questions from this section.

- 13 (a) Rajah 5 menunjukkan tujuh keping kad huruf.
Diagram 5 shows seven pieces of letter cards.



Rajah 5
Diagram 5

Lima keping kad dipilih secara rawak untuk membentuk satu kod. Cari bilangan cara untuk menyusun semua huruf itu dalam sebaris jika
Five pieces of cards are chosen at random to form a code. Find the number of ways to arrange all the letters in a row if

- (i) semua huruf vokal mesti bersebelahan,
all the vowels must be next to each other,
- (ii) sekurang-kurangnya 3 huruf konsonan disusun bersebelahan.
at least 3 consonant letters are arranged side by side.

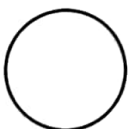
[5 markah]
[5 marks]

- (b) Diberi ${}^n C_r = {}^{n-2} C_r$, ungkapkan n dalam sebutan r .
Given ${}^n C_r = {}^{n-2} C_r$, express n in terms of r .

[3 markah]
[3 marks]

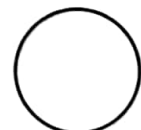
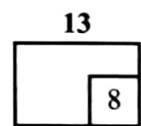
Jawapan / Answer :

- (a) (i)



(a) (ii)

(b)



14 (a) Diberi bahawa $x = t^3 - 6$ dan $\frac{dy}{dt} = \frac{9}{2}t^5$.

It is given that $x = t^3 - 6$ and $\frac{dy}{dt} = \frac{9}{2}t^5$.

Cari

Find

(i) $\frac{dx}{dt}$,

(ii) $\frac{dy}{dx}$, dalam sebutan x .

$\frac{dy}{dx}$, in terms of x .

[3 markah]

[3 marks]

(b) Cari koordinat titik pada lengkung $y = (3 - 15x)^3$ dengan keadaan kecerunan normal kepada lengkung pada titik itu ialah $\frac{1}{5}$.

Find the coordinates of the point on the curve $y = (3 - 15x)^3$ such that the gradient of the normal to the curve at the point is $\frac{1}{5}$.

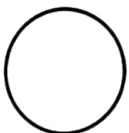
[5 markah]

[5 marks]

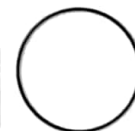
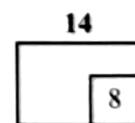
Jawapan / Answer :

(a) (i)

(ii)



(b)



- 15 (a) Diberi $ax^2 + bx + c = 0$. Terbitkan rumus kuadratik dengan menggunakan kaedah penyempurnaan kuasa dua.

Given $ax^2 + bx + c = 0$. Derive the quadratic formula by using completing the square method.

[5 markah]

[5 marks]

- (b) Dengan menggunakan rumus kuadratik yang diterbitkan daripada 15(a), tentukan punca-punca bagi persamaan kuadratik $9x^2 - 6x + 5 = 0$. Berikan jawapan anda dalam sebutan nombor khayalan, i dengan $i = \sqrt{-1}$.

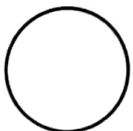
By using the quadratic formula derived from 15(a), determine the roots of the quadratic equation $9x^2 - 6x + 5 = 0$. Give your answer in terms of imaginary number, i with $i = \sqrt{-1}$.

[3 markah]

[3 marks]

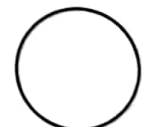
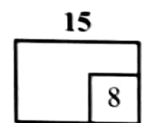
Jawapan / Answer :

(a)



(b)

KERTAS PEPERIKSAAN TAMAT
END OF QUESTION PAPER



**KEBARANGKALIAN Hujung Atas $Q(z)$ BAGI TABURAN NORMAL $N(0, 1)$
THE UPPER TAIL PROBABILITY $Q(z)$ FOR THE NORMAL DISTRIBUTION $N(0, 1)$**

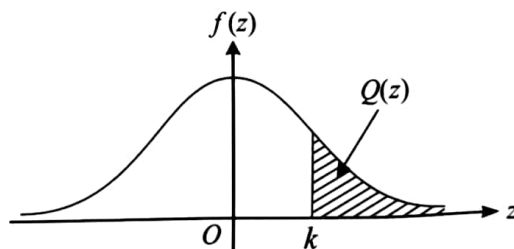
z											Minus / Tolak								
	0	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641	4	8	12	16	20	24	28	32	36
0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247	4	8	12	16	20	24	28	32	36
0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859	4	8	12	15	19	23	27	31	35
0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483	4	7	11	15	19	22	26	30	34
0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121	4	7	11	15	18	22	25	29	32
0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776	3	7	10	14	17	20	24	27	31
0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2483	0.2451	3	7	10	13	16	19	23	26	29
0.7	0.2420	0.2389	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148	3	6	9	12	15	18	21	24	27
0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867	3	5	8	11	14	16	19	22	25
0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611	3	5	8	10	13	15	18	20	23
1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379	2	5	7	9	12	14	16	19	21
1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170	2	4	6	8	10	12	14	16	18
1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985	2	4	6	7	9	11	13	15	17
1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823	2	3	5	6	8	10	11	13	14
1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681	1	3	4	6	7	8	10	11	13
1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559	1	2	4	5	6	7	8	10	11
1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455	1	2	3	4	5	6	7	8	9
1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367	1	2	3	4	4	5	6	7	8
1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294	1	1	2	3	4	4	5	6	6
1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233	1	1	2	2	3	4	4	5	5
2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183	0	1	1	2	2	3	3	4	4
2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143	0	1	1	2	2	2	3	3	4
2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110	0	1	1	1	2	2	2	3	3
2.3	0.0107	0.0104	0.0102								0	1	1	1	1	2	2	2	2
				0.00990	0.00964	0.00939	0.00914				3	5	8	10	13	15	18	20	23
								0.00889	0.00866	0.00842	2	5	7	9	12	14	16	16	21
2.4	0.00820	0.00798	0.00776	0.00755	0.00734						2	4	6	8	11	13	15	17	19
						0.00714	0.00695	0.00676	0.00657	0.00639	2	4	6	7	9	11	13	15	17
2.5	0.00621	0.00604	0.00587	0.00570	0.00554	0.00539	0.00523	0.00508	0.00494	0.00480	2	3	5	6	8	9	11	12	14
2.6	0.00466	0.00453	0.00440	0.00427	0.00415	0.00402	0.00391	0.00379	0.00368	0.00357	1	2	3	5	6	7	9	9	10
2.7	0.00347	0.00336	0.00326	0.00317	0.00307	0.00298	0.00289	0.00280	0.00272	0.00264	1	2	3	4	5	6	7	8	9
2.8	0.00256	0.00248	0.00240	0.00233	0.00226	0.00219	0.00212	0.00205	0.00199	0.00193	1	1	2	3	4	4	5	6	6
2.9	0.00187	0.00181	0.00175	0.00169	0.00164	0.00159	0.00154	0.00149	0.00144	0.00139	0	1	1	2	2	3	3	4	4
3.0	0.00135	0.00131	0.00126	0.00122	0.00118	0.00114	0.00111	0.00107	0.00104	0.00100	0	1	1	2	2	2	3	3	4

Bagi z negatif guna hubungan:

For negative z use relation:

$$Q(z) = 1 - Q(-z) = P(-z)$$

$$f(z) = \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{1}{2}z^2\right)$$



Contoh / Example:

Jika $X \sim N(0, 1)$, maka

If $X \sim N(0, 1)$, then

$$P(X > k) = Q(k)$$

$$P(X > 2.1) = Q(2.1) = 0.0179$$