

3472/1
Matematik
Tambahan
Kertas 1
Ogos 2026
2 jam

Logo sekolah masing-masing



SEKOLAH MENENGAH KEBANGSAAN
KOTA TINGGI

PEPERIKSAAN PERCUBAAN SPM 2026

MATEMATIK TAMBAHAN TINGKATAN 5

Kertas 1
Dua jam

JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

- 1. Tulis **nama** dan **kelas** anda pada ruang yang disediakan.
- 2. Kertas peperiksaan ini mengandungi **dua** bahagian: **Bahagian A** dan **Bahagian B**.
- 3. Jawapan hendaklah ditulis pada ruang jawapan yang disediakan di dalam kertas peperiksaan ini.
- 4. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
- 5. Kerja mengira anda mesti ditunjukkan.
- 6. **Kertas peperiksaan** ini hendaklah diserahkan kepada pengawas peperiksaan pada akhir peperiksaan.

SOALAN	MARKAH PENUH	MARKAH DIPEROLEH
BAHAGIAN A		
1	6	
2	6	
3	5	
4	4	
5	6	
6	6	
7	3	
8	5	
9	4	
10	7	
11	6	
12	6	
JUMLAH	64	
BAHAGIAN B		
13	8	
14	8	
15	8	
JUMLAH	16	
JUMLAH MARKAH		

RUMUS
FORMULAE

1	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	18	Isi padu kisaran <i>Volume of revolution</i>
2	$a^m \times a^n = a^{m+n}$		$= \int_a^b \pi y^2 dx$ atau (or)
3	$a^m \div a^n = a^{m-n}$		$= \int_a^b \pi x^2 dy$
4	$(a^m)^n = a^{mn}$		
5	$\log_a mn = \log_a m + \log_a n$	19	$I = \frac{Q_1}{Q_0} \times 100$
6	$\log_a \frac{m}{n} = \log_a m - \log_a n$	20	$\bar{I} = \frac{\sum I_i W_i}{\sum W_i}$
7	$\log_a m^n = n \log_a m$	21	${}^n P_r = \frac{n!}{(n-r)!}$
8	$\log_a b = \frac{\log_c b}{\log_c a}$	22	${}^n C_r = \frac{n!}{(n-r)!r!}$
9	$T_n = a + (n-1)d$	23	$P(X=r) = {}^n C_r p^r q^{n-r}, p+q=1$
10	$S_n = \frac{n}{2}[2a + (n-1)d]$	24	Min / Mean, $\mu = np$
11	$T_n = ar^{n-1}$	25	$\sigma = \sqrt{npq}$
12	$S_n = \frac{a(1-r^n)}{1-r} = \frac{a(r^n-1)}{r-1}, r \neq 1$	26	$z = \frac{X-\mu}{\sigma}$
13	$S_\infty = \frac{a}{1-r}, r < 1$	27	Panjang lengkok, $s = j\theta$ Arc length, $s = r\theta$
14	$y = uv, \frac{dy}{dx} = u \frac{dv}{dx} + v \frac{du}{dx}$	28	Luas sektor, $L = \frac{1}{2}j^2\theta$ Area of sector, $A = \frac{1}{2}r^2\theta$
15	$y = \frac{u}{v}, \frac{dy}{dx} = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$	29	$\sin^2 A + \cos^2 A = 1$ $\sin^2 A + \cos^2 A = 1$
16	$\frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$	30	$\sec^2 A = 1 + \tan^2 A$ $\sec^2 A = 1 + \tan^2 A$
17	Luas di bawah lengkung <i>Area under a curve</i> $= \int_a^b y dx$ atau (or) $= \int_a^b x dy$	31	$\operatorname{cosec}^2 A = 1 + \cot^2 A$ $\operatorname{cosec}^2 A = 1 + \cot^2 A$

$$32 \quad \sin 2A = 2 \sin A \cos A$$

$$\sin 2A = 2 \sin A \cos A$$

$$33 \quad \begin{aligned} \cos 2A &= \cos^2 A - \sin^2 A \\ &= 2 \cos^2 A - 1 \\ &= 1 - 2 \sin^2 A \\ \cos 2A &= \cos^2 A - \sin^2 A \\ &= 2 \cos^2 A - 1 \\ &= 1 - 2 \sin^2 A \end{aligned}$$

$$34 \quad \tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$$

$$35 \quad \begin{aligned} \sin (A \pm B) &= \sin A \cos B \pm \cos A \sin B \\ \sin (A \pm B) &= \sin A \cos B \pm \cos A \sin B \end{aligned}$$

$$36 \quad \begin{aligned} \cos (A \pm B) &= \cos A \cos B \mp \sin A \sin B \\ \cos (A \pm B) &= \cos A \cos B \mp \sin A \sin B \end{aligned}$$

$$37 \quad \tan (A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$$

$$38 \quad \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$39 \quad \begin{aligned} a^2 &= b^2 + c^2 - 2bc \cos A \\ a^2 &= b^2 + c^2 - 2bc \cos A \end{aligned}$$

$$40 \quad \begin{aligned} &\text{Luas segi tiga / Area of triangle} \\ &= \frac{1}{2} ab \sin C \end{aligned}$$

$$41 \quad \begin{aligned} &\text{Titik yang membahagi suatu tembereng} \\ &\text{garis} \end{aligned}$$

A point dividing a segment of a line

$$(x, y) = \left(\frac{nx_1 + mx_2}{m + n}, \frac{ny_1 + my_2}{m + n} \right)$$

$$42 \quad \begin{aligned} &\text{Luas segi tiga / Area of triangle} \\ &= \frac{1}{2} |(x_1 y_2 + x_2 y_3 + x_3 y_1) - ((x_2 y_1 + x_3 y_2 + x_1 y_3))| \end{aligned}$$

$$43 \quad |\underline{r}| = \sqrt{x^2 + y^2}$$

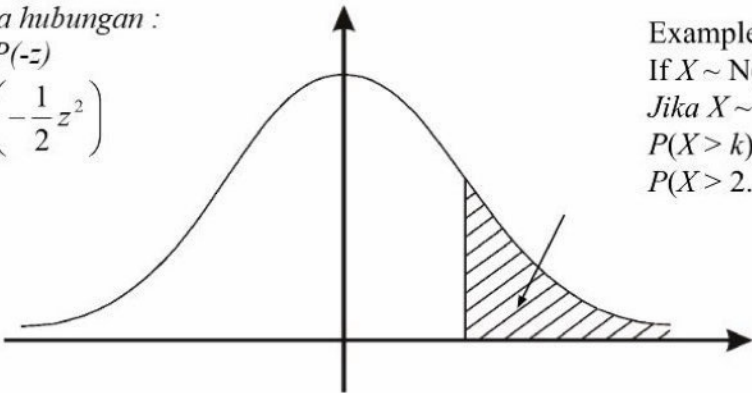
$$44 \quad \hat{\underline{r}} = \frac{x\underline{i} + y\underline{j}}{\sqrt{x^2 + y^2}}$$

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	0	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
											Minus / Tolak								
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

For negative z use relation :
Bagi z negative guna hubungan :
 $Q(z) = 1 - Q(-z) = P(-z)$

If $f(z) = \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{1}{2}z^2\right)$
 $Q(z) = \int_k^{\infty} f(z) dz$



Example/Contoh
If $X \sim N(0, 1)$, then
Jika $X \sim N(0, 1)$, maka
 $P(X > k) = Q(k)$
 $P(X > 2.1) = Q(2.1) = 0.0179$

Bahagian A**Section A**

[64 markah]

[64 marks]

Jawab **semua** soalanAnswer **all** questions

- 1 (a) Titik-titik $M(6k,k)$, $N(a,b)$ dan $P(2a,5b)$ terletak pada suatu garis lurus. Titik N membahagi garis lurus MP dengan nisbah $3:2$. Ungkapkan a dalam sebutan b . [2 markah]
Points $M(6k,k)$, $N(a,b)$ and $P(2a,5b)$ lie on a straight line. Point N divides the line segment MP in the ratio $3:2$. Express a in terms of b . [2 marks]
- (b) Titik P bergerak dengan jaraknya dari titik $A(2,3)$ dan $B(5,-1)$ sentiasa dalam nisbah $3:2$. Cari persamaan lokus bagi titik bergerak P [3 Markah]
A point P moves such that its distances from points $A(2,3)$ and $B(5,-1)$ are always in the ratio $3:2$. Find the equation of the locus of the moving point P . [3 marks]

Jawapan / Answer :

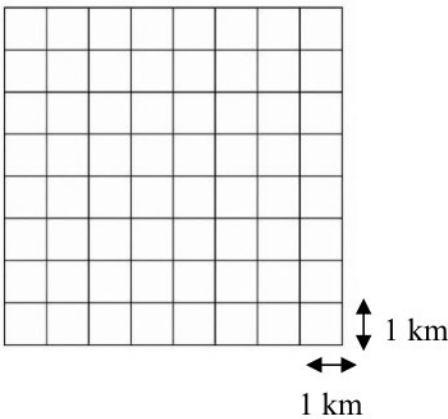
- 2
- (a)
- $\overrightarrow{PQ}$ mewakili sesaran 6 km ke kanan.

$\overrightarrow{PQ}$ represents a displacement of 6 km to the right.

Tentukan sama ada kuantiti berikut ialah kuantiti **vektor** atau **skalar**. Kemudian, lukis dan label dalam grid diberi. [3 markah]

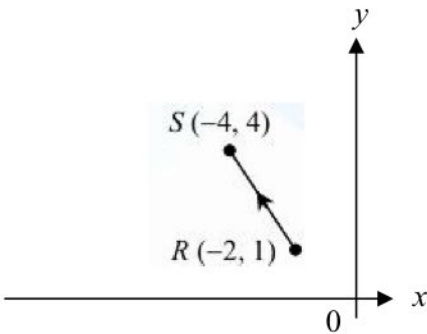
Determine whether the following quantities are **vector** or **scalar** quantities. Then, draw and label them in the given grid. [3 marks]

Jawapan/answer :



- (b)
- Rajah 1 menunjukkan vektor $\overrightarrow{RS}$ yang dilukis pada satu satah Cartes. Cari **magnitud** dan **arah pergerakan** vektor itu. [3 markah]

The diagram shows a vector $\overrightarrow{RS}$ is drawn on a Cartesian plane. Find **magnitude** and **direction** of the vector. [3 marks]



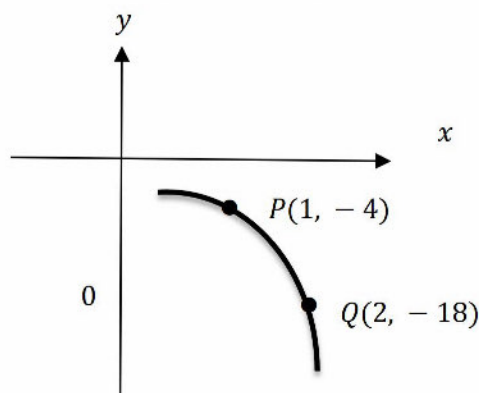
Jawapan/answer :

- 3 (a) Sebutan ke- n bagi suatu jangjang geometri diberi oleh $T_n = p(4)^{n-1}$, dengan keadaan p ialah pemalar. Diberi bahawa hasil tambah dua sebutan pertama ialah 30. Tentukan
- The n -th term of a geometric progression is given by $T_n = p(4)^{n-1}$, where p is a constant. Given that the sum of the first two terms is 30, determine:*
- (i) nilai p ,
the value of p ,
 - (ii) sebutan pertama jangjang tersebut.
the first term of the progression
- [3 markah]
[3 marks]
- (b) Ungkapkan nombor perpuluhan berulang 0.646464... dalam bentuk pecahan termudah dengan menggunakan konsep jangjang geometri. [2 markah]
- Express the recurring decimal 0.646464... in its simplest fractional form by using the concept of geometric progression.* [2 marks]

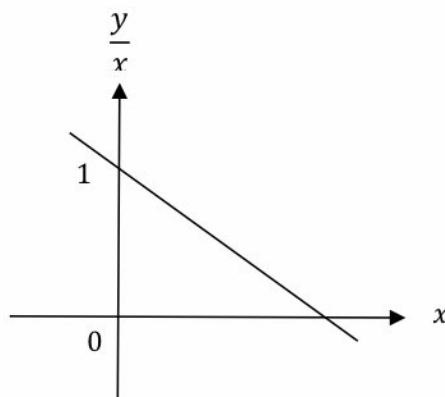
Jawapan/Answer

- 4 Rajah 2(a) menunjukkan sebahagian daripada lengkung $y = ax^2 + bx$, dengan keadaan a dan b ialah pemalar.

Figure 2(a) shows part of the curve $y = ax^2 + bx$, where a and b are constants.



Rajah 2(a)
Diagram 2(a)



Rajah 2(b)
Diagram 2(b)

- (a) Graf bagi lengkung $y = ax^2 + bx$ ditukar kepada bentuk linear, satu garis lurus diperolehi seperti yang ditunjukkan dalam rajah 2(b). Cari

The graph of the curve $y = ax^2 + bx$ is converted into a linear form, resulting in a straight line as shown in figure 2(b). Find

- kecerunan bagi garis lurus
the gradient of a straight line
- pintasan- x
the x -intercept

[3 markah]

[3 marks]

- (b) Lakarkan graf $\frac{y}{x^2}$ melawan $\frac{1}{x}$ dengan menunjukkan titik P dan Q .

[1 markah]

Sketch the graph of $\frac{y}{x^2}$ against $\frac{1}{x}$, showing points P and Q .

[1 mark]

Jawapan/ Answer

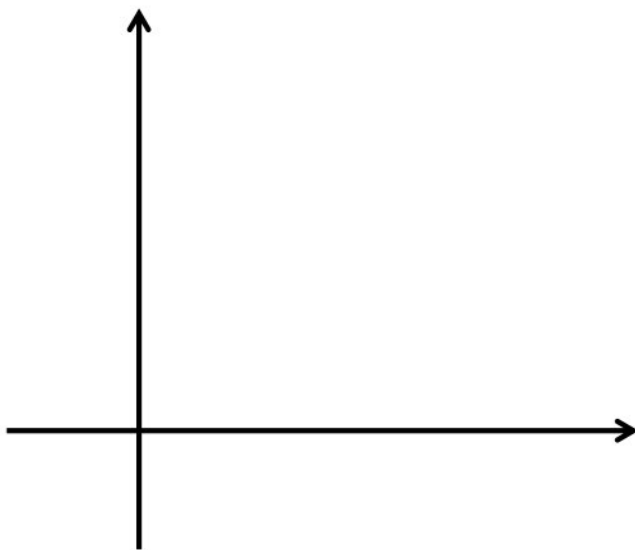
- (a) (i)



Jawapan/ *Answer*

(a)(ii)

(b)



- 5 (a) Persamaan kuadrat $3x^2 + 5x - 2 = 0$ mempunyai punca-punca p dan q , dengan keadaan $p > q$. Cari nilai p dan nilai q . [3 markah]
The quadratic equation $3x^2 + 5x - 2 = 0$ has roots p and q , where $p > q$. Find the value of p and of q . [3 marks]
- (b) Menggunakan nilai p dan nilai q dari 5 (a), bentukkan persamaan kuadrat yang mempunyai punca-punca $\frac{2}{p}$ dan $\frac{2}{q}$. [3 markah]
Using the values of p and q from 5(a), form the quadratic equation which has roots $\frac{2}{p}$ and $\frac{2}{q}$ [3 marks]

Jawapan/ Answer:

(a)

(b)





6 Diberi pasangan persamaan berikut :

Given the following pairs of equations :

$$x + y = 4$$

$$x^2 + y^2 = 16$$

(a) Lengkapi jadual nilai y bagi persamaan berikut.

Complete the table of y values for the following equation.

x	-4	-3	-2	-1	0	1	2	3	4
$x + y = 4$		7	6	5	4	3	2	1	0
$x^2 + y^2 = 16$	0	± 2.65	± 3.46	± 3.87		± 3.87	± 3.46	± 2.65	0

[2 markah]

[2 marks]

(b) Dengan menggunakan skala 2 cm 1 unit pada kedua-dua paksi, lukis graf bagi $x + y = 4$ dan $x^2 + y^2 = 16$ dengan domain $-4 \leq x \leq 4$.

[3 markah]

Using a scale of 2 cm for 1 unit on both axes, draw the graph of $x + y = 4$ and $x^2 + y^2 = 16$ with domain $-4 \leq x \leq 4$.

[3 marks]

(c) Seterusnya, tentukan penyelesaian persamaan serentak berikut.

[1 markah]

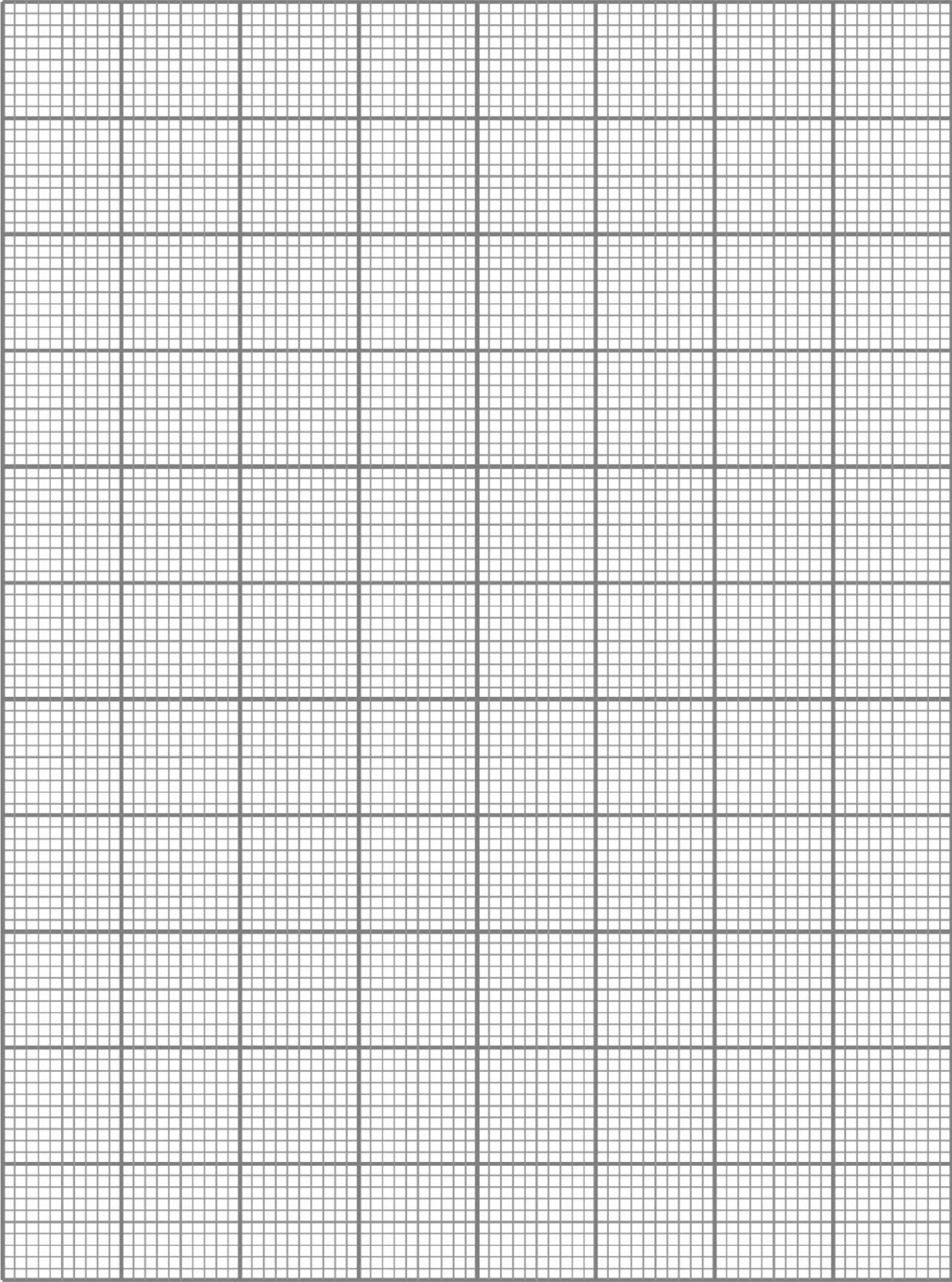
Hence, determine the solution to the simultaneous equations.

[1 mark]

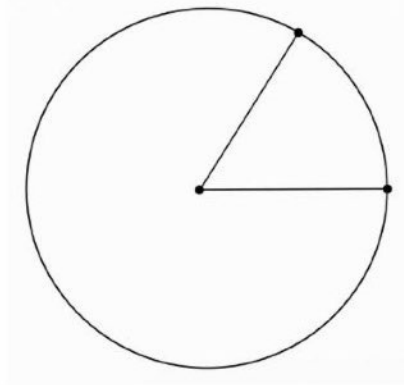
Jawapan /Answer :

Jawapan/*Answer* :

(b)



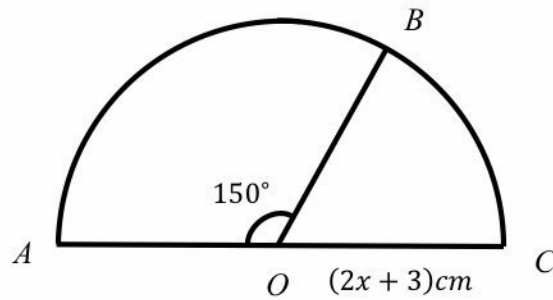
- 7 (a) Lukis dan labelkan sudut pusat yang bersamaan 1 rad pada Rajah 3 di ruang jawapan. [1 markah]
Draw and label a central angle of 1 rad on the Diagram 3 in the answer space. [1 mark]



Rajah 3

Diagram 3

- (b) Rajah 4 menunjukkan semibulatan ABC dengan pusat O . Hitung panjang AB dalam sebutan x dan π . [2 markah]
Diagram 4 shows a semicircle ABC with center O . Calculate the length of AB in terms of x and π . [2 marks]



Rajah 4

Diagram 4

Jawapan/Answer:

- 8 (a) Cari nilai bagi had berikut:

Find the value of the following limit:

$$\text{had}_{x \rightarrow 1} \frac{x^2 - 1}{x - 1}$$
$$\lim_{x \rightarrow 1} \frac{x^2 - 1}{x - 1}$$

[2 markah]

[2 marks]

- (b) Diberi fungsi $f(x) = 3x^2$. Cari terbitan pertama bagi fungsi tersebut dengan menggunakan prinsip pertama.

[3 markah]

Given the function $f(x) = 3x^2$. Find the first derivative of the function using the first principle.

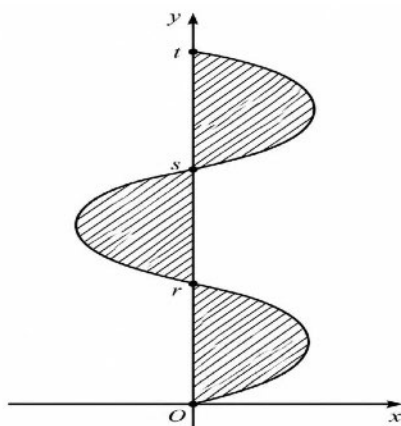
[3 marks]

Jawapan / Answer:

(a)

(b)

- 9 Rajah 5 menunjukkan graf $x = f(y)$.
 Diagram 5 shows the graph $x = f(y)$.



Rajah 5
 Diagram 5

Diberi bahawa luas kawasan berlorek ialah 6 unit² dan $\int_0^r f(y)dy = \frac{7}{4}, \int_s^t f(y)dy = 1$.

It is given that area of the shaded region is 6 unit² and $\int_0^r f(y)dy = \frac{7}{4}, \int_s^t f(y)dy = 1$.

Diberi bahawa $s = 2$. Cari nilai bagi

Given that $s = 2$. Find the value of

- (a) $\int_r^s f(y)dy$
- (b) $\int_0^s f(y)dy$
- (c) $\int_0^s \left(2 + \frac{1}{2}f(y)\right)$

[4 markah]

[4 marks]

Jawapan/ Answer:

(a)

(b)

(c)

- 10** (a) Selesaikan persamaan
Solve the equation

$$3^{x+1} - 3^x = 18$$

[3 markah]

[3 marks]

- (b) Sebuah segitiga bersudut tegak PQR dengan lebar $PQ = 3\sqrt{2} + 4$ cm mempunyai keluasan $8\sqrt{2} + 10$ cm². Cari tinggi QR , dalam cm, segitiga tersebut dalam bentuk $a + b\sqrt{2}$. [4 markah]
A right-angled triangle PQR with a width $PQ = 3\sqrt{2} + 4$ cm has an area of $8\sqrt{2} + 10$ cm².
Find the height QR , in cm, of the triangle in the form of $a + b\sqrt{2}$. [4 marks]

Jawapan / Answer:

(a)

(b)

- 11 (a) Sebuah kotak mengandungi 5 biji bola merah dan 4 biji bola biru. Tiga biji bola dipilih secara rawak. Pemboleh ubah rawak X mewakili bilangan bola merah yang dipilih. Nyatakan sama ada X ialah pemboleh ubah rawak diskret atau pemboleh ubah rawak selanjar. Berikan justifikasi.

[1 markah]

A box contains 5 red balls and 4 blue balls. Three balls are selected at random. The random variable X represents the number of red balls selected. State whether X is a discrete random variable or a continuous random variable. Give a justification.

[1 mark]

- (b) Markah ujian Matematik bagi sekumpulan murid bertaburan normal dengan min, μ dan sisihan piawai, σ . Jika 20% murid memperoleh markah lebih daripada 75 dan 10% murid memperoleh markah kurang daripada 55, hitung nilai μ dan nilai σ .

[5 markah]

The Mathematics test scores of a group of students are normally distributed with mean, μ , and standard deviation, σ . If 20% of the students score more than 75 and 10% of the students score less than 55, calculate the value of μ and the value of σ .

Jawapan / Answer:



- 12** (a)(i) Berapakah bilangan cara untuk menyusun 8 orang murid untuk duduk di sebuah meja bulat di dalam sebuah dewan?
How many ways to arrange 8 students to sit in a round table in a hall?
- (ii) Cari bilangan susunan yang mungkin jika huruf-huruf dari perkataan 'STATISTIK' disusun dalam satu barisan.
Find the number of possible arrangements if the letters of the word 'STATISTIK' are arranged in a row.

[3 markah]

[3 marks]

Jawapan/answer :



- (b) Anggerik mempunyai 6 buah buku fiksi dan 4 buah buku bukan fiksi. Anggerik ingin mendermakan 4 buah buku kepada perpustakaan mini di kampungnya. Cari bilangan cara berbeza untuk Anggerik memilih jika

Anggerik has 6 fiction books and 4 non-fiction books. Anggerik wants to donate 4 books to the mini library in her village. Find the number of different ways for Anggerik to choose if

- (i) semua buku yang dipilih ialah buku bukan fiksi
all the books chosen are non-fiction books
- (ii) sekurang-kurang dua buah buku fiksi dipilih.
at least two fiction books are selected.

[3 markah]

[3 marks]

Jawapan/answer :

Bahagian B

Section B

[16 markah]

[16 marks]

Bahagian ini mengandungi **tiga** soalan. Jawab **dua** soalan.

*This section have **three** questions. Answer **two** question.*

- 13** (a) Diberi bahawa $f(x) = |3x - 1|$.
It is given that $f(x) = |3x - 1|$.
- (i) Cari domain jika $f(x) > 5$. [3 markah]
Find the domain if $f(x) > 5$. [3 marks]
- (ii) Lakar graf bagi $f(x) = |3x - 1|$ untuk $-1 \leq x \leq 3$. Seterusnya, nyatakan kodomain yang sepadan. [3 markah]
Sketch the graph of $f(x) = |3x - 1|$ for $-1 \leq x \leq 3$. Hence, state the corresponding codomain. [3 marks]
- (b) Diberi $f(x) = \frac{x}{x+1}$. Cari fungsi $f^n(x)$ dengan keadaan n ialah integer positif. [2 markah]
Given $f(x) = \frac{x}{x+1}$. Find the function of $f^n(x)$ if n is positive integer. [2 marks]

Jawapan/ Answer:

(a)

Jawapan/ *Answer*:

(b)

- 14** Bot A meninggalkan pelabuhan O semasa laut tenang, dengan halaju $V_A = 12\mathbf{i} + 16\mathbf{j} \text{ kmj}^{-1}$. Pada masa yang sama, bot B belayar dari pelabuhan P dengan halaju $V_B = -8\mathbf{i} + 8\mathbf{j} \text{ kmj}^{-1}$. Diberi vektor kedudukan pelabuhan P , $\overrightarrow{OP} = 100\mathbf{i} + 40\mathbf{j}$.
- Boat A left port O when the sea was calm, with the velocity of $V_A = 12\mathbf{i} + 16\mathbf{j} \text{ kmj}^{-1}$. At the same time, boat B left port P with velocity of $V_B = -8\mathbf{i} + 8\mathbf{j} \text{ kmj}^{-1}$. Given that position vector of port P is $\overrightarrow{OP} = 100\mathbf{i} + 40\mathbf{j}$.*

- (a) Selepas t jam, vektor kedudukan bot A ialah $\overrightarrow{OA} = t(12\mathbf{i} + 16\mathbf{j}) \text{ kmj}^{-1}$. Cari vektor kedudukan bagi bot B pada masa itu. [2 markah]
- After t hours, position vector of ship A is $\overrightarrow{OA} = t(12\mathbf{i} + 16\mathbf{j}) \text{ kmj}^{-1}$. Find the position vector of ship B at that time.* [2 marks]

- (b) Tunjukkan bahawa bot A akan memintas bot B dan cari masa apabila keadaan ini berlaku. [6 markah]
- Show that boat A will cross boat B and find the time when this occurs.* [6 marks]

Jawapan / Answer:

(a)

(b)

- 15 (a) Tanpa menggunakan kalkulator, cari nilai bagi kosek 105^0 . [4 markah]
Without using calculator, find the value of kos 75^0 . [4 marks]
- (b) Diberi kos $A = -\frac{5}{13}$, $0^0 < A < 180^0$ dan $\sin B = -\frac{3}{5}$, $90^0 < B < 270^0$. Cari kos $(A - B)$. [4 markah]
Given that kos $A = -\frac{5}{13}$, $0^0 < A < 180^0$ and $\sin B = -\frac{3}{5}$, $90^0 < B < 270^0$. Find kos $(A - B)$ [4 marks]

Jawapan / Answer:

KERTAS PEPERIKSAAN TAMAT