

ARAHAN KEPADA CALON

1. Kertas soalan ini mengandungi **15** soalan.
2. Jawab **semua** soalan dalam **Bahagian A** dan mana-mana **dua** soalan dalam **Bahagian B**.
3. Jawapan hendaklah ditulis pada ruang yang disediakan dalam kertas soalan.
4. Tunjukkan langkah-langkah penting dalam kerja mengira anda. Ini boleh membantu anda untuk mendapatkan markah.
5. Sekiranya anda hendak menukar jawapan, batalkan kerja mengira yang telah dibuat. Kemudian tulislah jawapan yang baru.
6. Rajah yang mengiringi soalan ini tidak dilukiskan mengikut skala kecuali dinyatakan.
7. Markah yang diperuntukkan bagi setiap soalan atau ceraian soalan ditunjukkan dalam kurungan.
8. Satu senarai rumus disediakan di halaman 3 & 4.
9. Jadual sifir matematik empat angka disediakan di halaman 5.
10. Penggunaan kalkulator saintifik yang tidak boleh diprogramkan adalah dibenarkan.
11. Kertas soalan ini hendaklah diserahkan pada akhir peperiksaan

INFORMATION FOR CANDIDATES

1. *This question paper consists of **15** questions.*
2. *Answer **all** questions in **Part A** and any **two** questions in **Part B**.*
3. *Write your answers clearly in the spaces provided in the question paper.*
4. *Show your working. It may help you to get marks.*
5. *If you wish to change your answer, cross out the work that you have done. Then write down the new answer.*
6. *The diagrams in the questions provided are not drawn to scale unless stated.*
7. *The marks allocated for each question are shown in brackets.*
8. *A list of formulae is provided on pages 3 & 4.*
9. *A table of four-figure mathematical tables is provided in page 5.*
10. *You may use a non-programmable scientific calculator.*
11. *This question paper must be handed in at the end of the examination.*

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

- | | | | |
|----|--|----|--|
| 1 | $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ | 18 | Isi padu kisanan
Volume of revolution

$= \int_a^b \pi y^2 dx$ atau (or)
$= \int_a^b \pi x^2 dy$ |
| 2 | $a^m \times a^n = a^{m+n}$ | | |
| 3 | $a^m \div a^n = a^{m-n}$ | | |
| 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 | $I = \frac{\sum I_i W_i}{\sum W_i}$ |
| 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
Area under a curve
$= \int_a^b y dx$ 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 $\sin 2A = 2 \sin A \cos A$
 $\sin 2A = 2 \sin A \cos A$
- 33 $\cos 2A = \cos^2 A - \sin^2 A$
 $= 2 \cos^2 A - 1$
 $= 1 - 2 \sin^2 A$
 $\cos 2A = \cos^2 A - \sin^2 A$
 $= 2 \cos^2 A - 1$
 $= 1 - 2 \sin^2 A$
- 34 $\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$
- 35 $\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$
 $\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$
- 36 $\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$
 $\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$
- 37 $\tan(A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$
- 38 $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$
- 39 $a^2 = b^2 + c^2 - 2bc \cos A$
 $a^2 = b^2 + c^2 - 2bc \cos A$
- 40 Luas segi tiga / *Area of triangle*
 $= \frac{1}{2} ab \sin C$
- 41 Titik yang membahagi suatu tembereng garis
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 Luas segi tiga / *Area of triangle*
 $= \frac{1}{2} |(x_1y_2 + x_2y_3 + x_3y_1) - ((x_2y_1 + x_3y_2 + x_1y_3))|$
- 43 $|\underline{r}| = \sqrt{x^2 + y^2}$
- 44 $\hat{\mathbf{r}} = \frac{x\hat{i} + y\hat{j}}{\sqrt{x^2 + y^2}}$

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

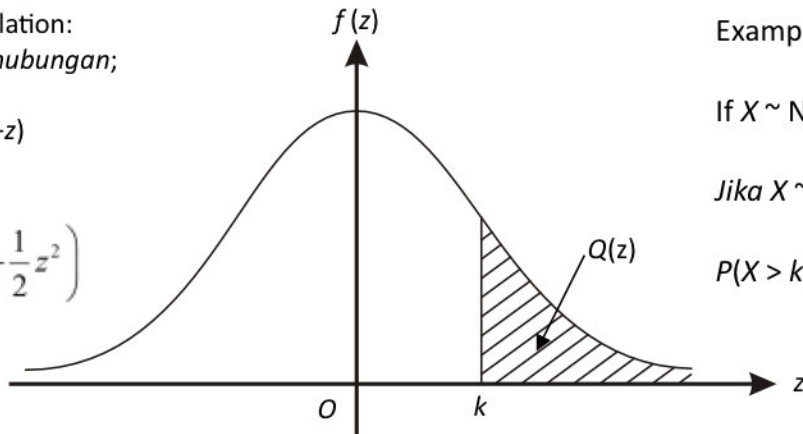
z	0	1	2	3	4	5	6	7	8	9	Minus / Tolak								
0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641	4	8	12	16	20	24	28	32	36
0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247	4	8	12	16	20	24	28	32	36
0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	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 negatif guna hubungan;

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

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

$$Q(z) = \int_k^{\infty} f(z) dz$$



Example / Contoh:

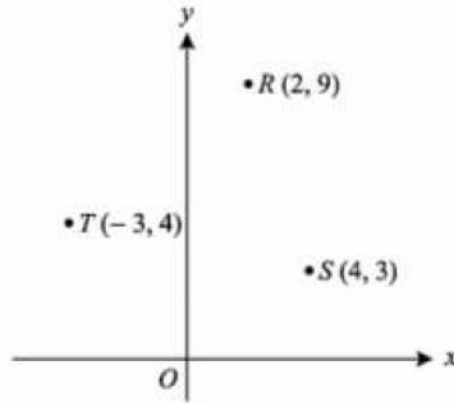
If $X \sim N(0, 1)$ then

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

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

Bahagian A / Section A
 [64 markah / 64 marks]
 Jawab **semua** soalan / Answer **all** questions

- 1 Rajah 1 menunjukkan koordinat titik R , S dan T pada satah Cartes.
 Diagram 1 shows coordinates of points R , S and T on a Cartesian plane.



Rajah 1 / Diagram 1

- (a) Garis RT memotong paksi- y di Y . Diberi bahawa $TY:YR = m:n$, tentukan nilai $\frac{m}{n}$.
 Line RT intersects the y -axis at point Y . Given that $TY:YR = m:n$, determine the value of $\frac{m}{n}$.
 [2 markah / marks]
- (b) Cari persamaan lokus bagi titik P yang bergerak supaya $PT:PS = 1:2$.
 Find the equation of the locus of point P which moves such that $PT:PS = 1:2$.
 [3 markah / marks]

Jawapan/Answer:

(a)

(b)



2

(a)

Sebuah troli dengan muatan seberat 80 N ditolak sejauh 20 m ke timur.
A trolley with a load of 80 N is pushed a distance of 20 m due to west.

Tentukan sama ada maklumat di atas adalah kuantiti skalar atau kuantiti vektor. Berikan alasan anda.

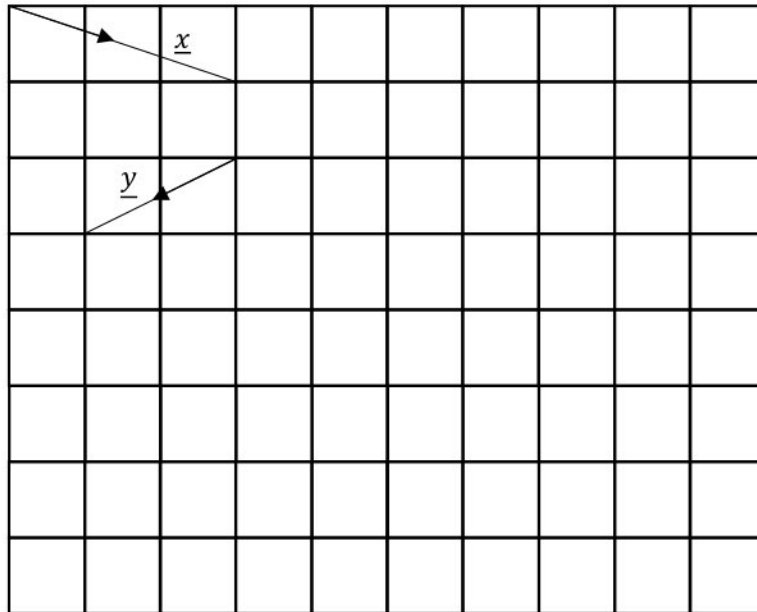
Determine whether the information above is a scalar quantity or vector quantity. Give your reason.

[1 markah / mark]

(b)

Rajah 2 menunjukkan $\underline{x}$ dan $\underline{y}$ yang dilukis pada grid segi empat sama dengan sisi 1 unit.

Diagram 2 shows $\underline{x}$ and $\underline{y}$ drawn on square grid with side of 1 unit.



Rajah 2 / Diagram 2

Lukis dan labelkan vektor $\underline{y} - \underline{x}$.

Seterusnya, nyatakan magnitud dan arah bagi vektor $\underline{y} - \underline{x}$.

Draw and label the vector of $\underline{y} - \underline{x}$.

Hence, state the magnitude and the direction of the vector $\underline{y} - \underline{x}$.

[3 markah / 3 marks]

(c)

Diberi suatu vektor $\underline{a} = 4\underline{i} - 8\underline{j}$. Cari vektor unit dalam arah $\underline{a}$.

Given a vector $\underline{a} = 4\underline{i} - 8\underline{j}$. Find a unit vector in direction of $\underline{a}$.

[2 markah / 2 marks]

Jawapan/Answer:

(a)

(c)

- 3 (a) Seutas reben panjang dipotong kepada beberapa bahagian dengan keadaan panjang bahagian pertama ialah $(2n - 7)$ cm, panjang bahagian kedua ialah $(n + 1)$ cm, panjang bahagian ketiga ialah $(3n - 3)$ cm dan seterusnya, dengan keadaan $n > 1$. Panjang setiap bahagian membentuk suatu jangjang geometri.

A piece of ribbon is cut into several pieces with the length of the first piece is $(2n - 7)$ cm, the length of the second piece is $(n + 1)$ cm, the length of the third piece is $(3n - 3)$ cm and so on, such that $n > 1$. The length of each part forms a geometric progression.

Hitung panjang bahagian reben yang pertama.

Calculate the first piece of the ribbon.

[3 markah / marks]

- (b) Ungkapkan perpuluhan berulang 1.2484848... dalam bentuk pecahan termudah.

Express the repeating decimals 1.2484848... in the simplest form of fraction.

[2 markah / marks]

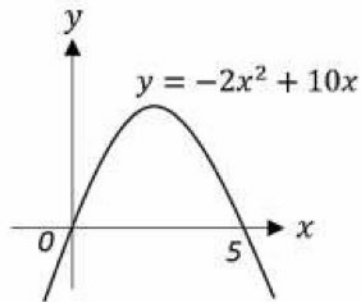
Jawapan/Answer:

(a)

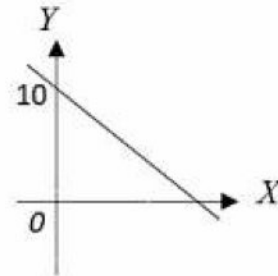
(b)



- 4 Rajah 4(a) menunjukkan pemboleh ubah x dan y dihubungkan oleh persamaan $y = -2x^2 + 10x$ manakala Rajah 4(b) adalah graf persamaan linear yang terbentuk diwakili oleh paksi- Y dan paksi- X .
Diagram 4(a) shows the variables x and y connected by the equation $y = -2x^2 + 10x$ while the Diagram 4(b) is a graph of linear equation formed represented by the Y -axis and the X -axis.



Rajah 4(a)
Diagram 4(a)



Rajah 4(b)
Diagram 4(b)

- (a) Cari kecerunan dan pintasan- X .
Find the gradient and the X -intercept.
- (b) Lakar satu graf baru mempunyai paksi- $\frac{1}{x}$.
Sketch a new graph that consist of $\frac{1}{x}$ -axis.

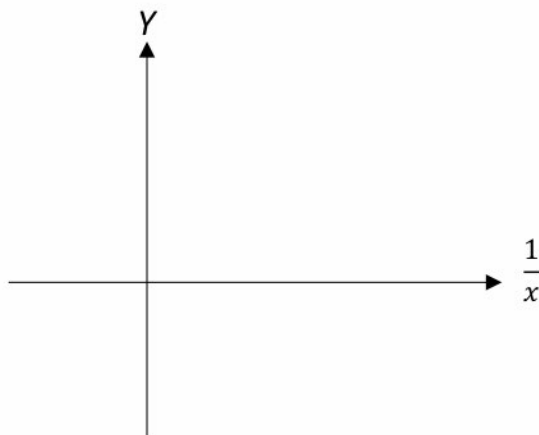
[3 markah / marks]

[1 markah / mark]

Jawapan/Answer:

(a)

(b)



- 5 Satu persamaan kuadratik diberi oleh $x^2 + 9x = -2k$, dengan keadaan k ialah pemalar.
A quadratic equation is given by $x^2 + 9x = -2k$, such that k is a constant.

Diberi bahawa persamaan itu mempunyai punca-punca α dan β .

Bentukkan satu persamaan kuadratik dengan punca-punca $2 + \alpha - \beta$ dan $2 - \alpha + \beta$ dalam sebutan k .

It is given that the equation has roots α and β .

Form a quadratic equation with roots $2 + \alpha - \beta$ and $2 - \alpha + \beta$ in terms of k .

[6 markah / marks]

Jawapan/Answer:

- 6 (a) Lengkapkan Jadual 6 dalam ruang jawapan bagi persamaan-persamaan $2y + 2x = 3$ dan $y^2 - 2x = 0$.

Complete Table 6 in the answer space for the equations of $2y + 2x = 3$ and $y^2 - 2x = 0$.

[2 markah / 2 marks]

- (b) Untuk ceraian soalan ini, gunakan kertas graf yang telah disediakan.
For this part of question, use graph paper provided.

Dengan menggunakan skala 2 cm kepada 1 unit pada kedua-dua paksi, lukiskan kedua-dua graf bagi $2y + 2x = 3$ dan $y^2 - 2x = 0$ bagi $0 \leq x \leq 5$.

Seterusnya, nyatakan titik-titik persilangan bagi kedua-dua graf itu.

By using a scale of 2 cm to 1 unit on the both axes, draw the both graphs of $2y + 2x = 3$ and $y^2 - 2x = 0$ for $0 \leq x \leq 5$.

Hence, state the intersections for the both graphs.

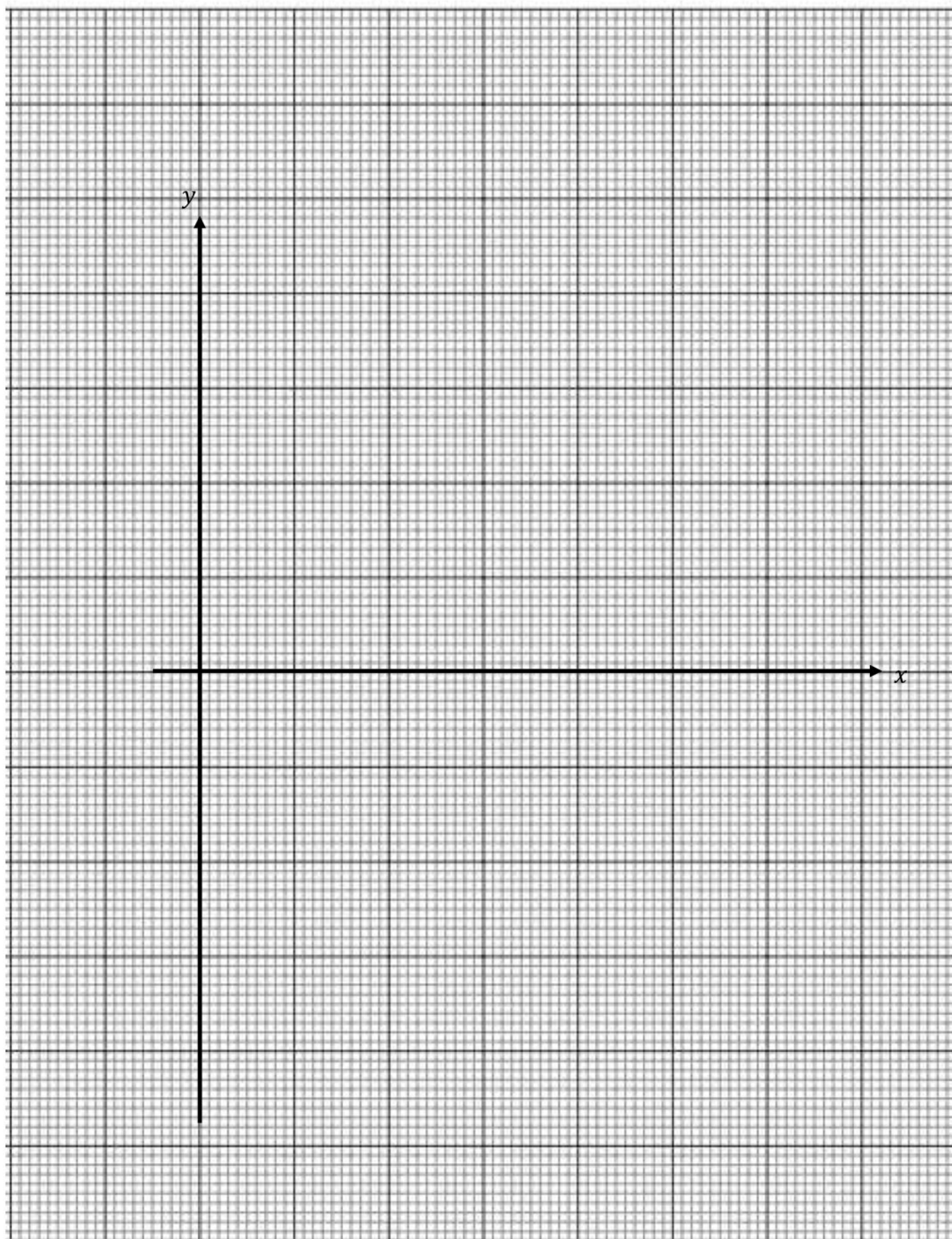
[4 markah / 4 marks]

Jawapan/Answer:

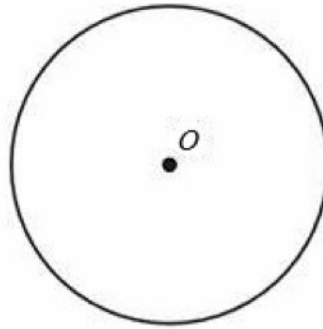
(a)

x	0	1	2	3	4	5
$2y + 2x = 3$						
$y^2 - 2x = 0$						

Jadual 6 / Table 6



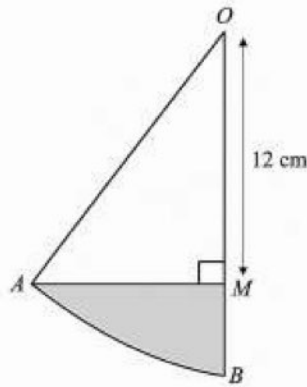
- 7 (a) Diberi sebuah bulatan berpusat O mempunyai jejari $2r$ cm. Lakar dan label 1 rad pada Rajah 7(a).
Given a circle centred at O have radius $2r$ cm. Sketch and label 1 rad in Diagram 7(a).



Rajah 7(a) / Diagram 7(a)

[1 markah / mark]

- (b) Rajah 7(b) menunjukkan sektor OAB berpusat O .
Diagram 7(b) shows a sector OAB with centre O .



Rajah 7(a) / Diagram 7(a)

[Guna / Use $\pi = 3.142$]

Diberi $\angle AOB = 0.53$ rad dan $OM = 12$ cm, hitung
Given that $\angle AOB = 0.53$ rad and $OM = 12$ cm, calculate

- (i) jejari dalam cm, bagi sektor,
the radius, in cm of the sector;
- (ii) panjang lengkok AB .
arc length of AB .

[2 markah / marks]

[2 markah / marks]

Jawapan/Answer:

(b)

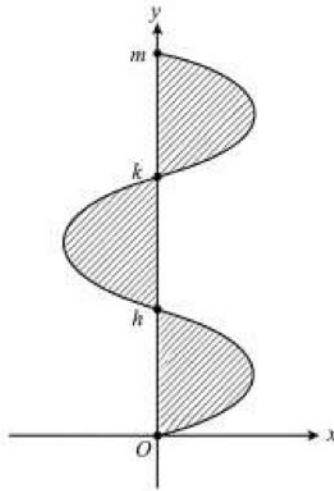


- 8 Diberi $y = 5x^2 + 3x$, cari $\frac{dy}{dx}$ dengan menggunakan prinsip pertama.
Given $y = 5x^2 + 3x$, find $\frac{dy}{dx}$ by using first principles.

[4 markah / 4 marks]

Jawapan/Answer:

- 9 Rajah 9 menunjukkan suatu graf $x = f(y)$.
 Diagram 9 shows a graph of $x = f(y)$.



Rajah 9 / Diagram 9

Diberi bahawa luas kawasan berlorek ialah 9 unit² dan $\int_0^h f(y) dy = \int_k^m f(y) dy = 3$. Cari nilai bagi
 Given that the area of the shaded region is 9 unit² and $\int_0^h f(y) dy = \int_k^m f(y) dy = 3$. Find the value of

- (a) $\int_0^k f(y) dy$,
 (b) $\int_h^k x dy + \int_k^m \frac{4}{3} f(y) dy$.

[4 markah / marks]

Jawapan/Answer:

(a)

(b)



- 10 (a) Diberi bahawa $2^{x+1} - 2^{x-1} = k(2^{x-1})$ dengan keadaan k ialah pemalar. Cari nilai k .

Given that $2^{x+1} - 2^{x-1} = k(2^{x-1})$, where k is a constant. Find the value of k .

[3 markah / marks]

- (b) Rajah 10 menunjukkan sebuah bekas silinder yang direka oleh sebuah syarikat pengeluar pensel untuk jualan set hadiah.

Diagram 10 shows a cylindrical container designed by a pencil production company for the gift set sales.



Rajah 10 / Diagram 10

Untuk membungkus enam batang pensel, jejari bekas mesti $\left(\frac{3}{\sqrt{6}} + \sqrt{3}\right)$ cm. Diberi luas permukaan melengkung bekas ialah $\pi(20\sqrt{2} + 10)$ cm², cari tinggi bekas tersebut dalam bentuk $p\sqrt{3} + q\sqrt{6}$.

In order to pack six pencils, the radius of the container must be $\left(\frac{3}{\sqrt{6}} + \sqrt{3}\right)$ cm. Given that the curve surface area of the container is $\pi(20\sqrt{2} + 10)$ cm², find the height of the container in form of $p\sqrt{3} + q\sqrt{6}$.

[4 markah / marks]

Jawapan/Answer:

(a)

(b)

11 (a)

Bilangan telefon bimbit yang dijual oleh sebuah kedai setiap minggu.
The number of handphones sold by a shop weekly.

Tentukan sama ada peristiwa di atas merupakan pemboleh ubah rawak diskret atau selanjar.
Determine whether the event is a discrete or continuous random variables.

[1 markah / mark]

- (b) Jisim sekampit beras, dalam kg, bertaburan secara normal dengan min, μ kg dan sisihan piawai, σ kg. Jika 97.50% daripada kampakit beras itu mempunyai jisim kurang daripada 50.1 kg dan 88.49% daripadanya mempunyai jisim lebih daripada 34.3 kg, cari nilai bagi μ dan nilai σ .

The mass of a sack of rice, in kg, is normally distributed with mean, μ kg, and standard deviation, σ kg. If 97.50% of the sacks of rice have a mass of less than 50.1 kg and 88.49% of them have a mass of more than 34.3 kg, find the value of μ and the value of σ .

[5 markah / marks]

Jawapan/Answer:

(a)

(b)

- 12 (a) (i) Cari bilangan cara menyusun tujuh orang murid dalam satu bulatan.
Find the number of ways to arrange seven pupils in a circle. [1 markah / mark]
- (ii) Cari bilangan cara susunan berbeza yang mungkin bagi semua huruf dalam perkataan **MATEMATIK** jika huruf vokal sentiasa bersama.
Find the number of different possible arrangements of all the letters in the word MATEMATIK if the vowels are always together. [2 markah / marks]
- (b) Terdapat enam orang graduan lelaki dan lima orang graduan wanita yang menghadiri sesi temu duga kerja di sebuah syarikat. Cari bilangan cara bagi majikan memilih tujuh orang pekerja jika
There are six male graduates and five female graduates who attend a job interview session at a company. Find the number of ways the employer can select seven employees if
- (i) semua graduan lelaki dan dua orang graduan wanita mendapat pekerjaan,
all male graduates and two female graduates got jobs, [1 markah / mark]
- (ii) sekurang-kurangnya empat orang graduan wanita mendapat pekerjaan.
at least four female graduates found jobs. [2 markah / marks]

Jawapan/Answer:

(a)

(b)



Bahagian B / Section B
[16 markah / 16 marks]
Jawab **dua** soalan / Answer **two** questions

13 Diberi fungsi
Given the function

$$f(x) = |2x - 4|$$

- (a) Lakarkan graf fungsi $y = f(x)$ bagi domain $-1 \leq x \leq 5$
Sketch the graph of the function $y = f(x)$ for domain $-1 \leq x \leq 5$.

[3 markah / marks]

- (b) Diberi fungsi
Given the function

$$g(x) = x + 1$$

Cari ungkapan bagi fungsi gubahan $fg(x)$ dan nyatakan nilai bagi $fg(2)$.
Find the expression for the composite function $fg(x)$ and state the value of $fg(2)$.

[3 markah / marks]

- (c) Seterusnya, dengan menggunakan graf atau kaedah yang sesuai, cari domain bagi x apabila $f(x) > 3$.
Next, using the graph or any suitable method, determine the domain of x when $f(x) > 3$.

[2 markah / marks]

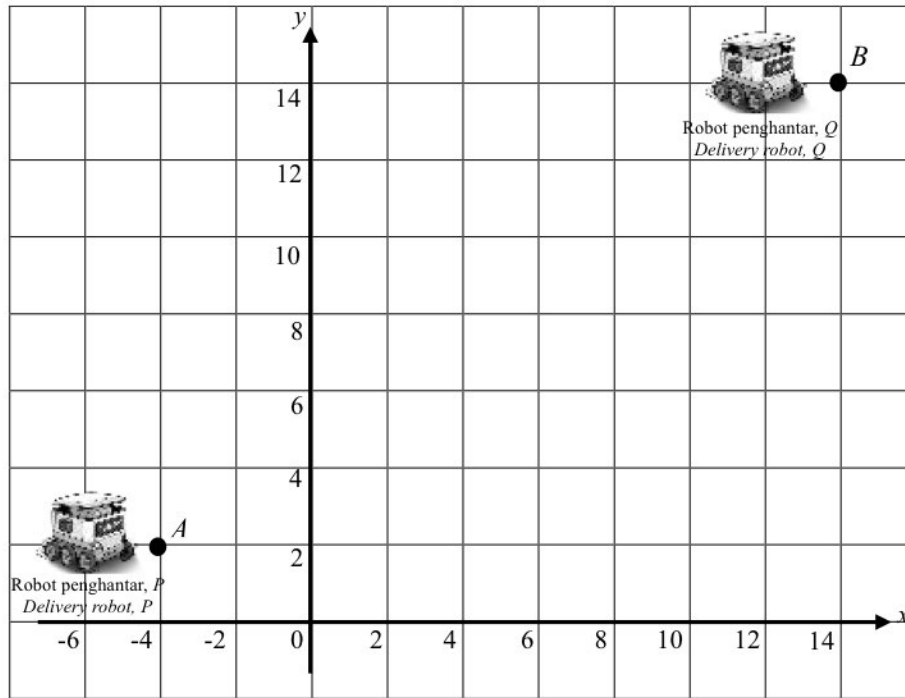
Jawapan/Answer:

(a)

(b)

(c)

- 14 Rajah 14 menunjukkan pergerakan dua buah robot penghantar, P dan Q , dalam satah Cartes. Diagram 14 shows the movement of two delivery robots, P and Q , in a Cartesian plane.



Rajah 14 / Diagram 14

Robot penghantar, P memulakan perjalanannya dari titik $A (-4, 2)$ dengan vektor halaju $(3\mathbf{i} + 2\mathbf{j})$ unit min^{-1} .
 Delivery robot P starts its journey from point $A (-4, 2)$ with velocity vector $(3\mathbf{i} + 2\mathbf{j})$ unit min^{-1} .

Pada masa yang sama, robot penghantar, Q memulakan perjalanannya dari titik $B (14, 14)$ dengan vektor halaju $(\mathbf{i} + \frac{2}{3}\mathbf{j})$ unit min^{-1} .

At the same time, delivery robot, Q starts from point $B (14, 14)$ with velocity vector $(\mathbf{i} + \frac{2}{3}\mathbf{j})$ unit min^{-1} .

Kedua-dua robot bergerak secara berterusan dalam garis lurus.

Both robots move continuously in straight lines.

- (a) Diberi bahawa vektor kedudukan robot penghantar, P selepas t minit ialah
 Given that the position vector of delivery robot, P after t minutes is

$$\overrightarrow{OP} = (-4\mathbf{i} + 2\mathbf{j}) + t(3\mathbf{i} + 2\mathbf{j}).$$

Cari vektor kedudukan robot penghantar, Q selepas t minit.

Find the position vector of delivery robot, Q after t minutes.

[3 markah / marks]

- (b) Tunjukkan bahawa kedua-dua robot akan bertemu pada titik yang sama dan tentukan masa yang diambil.

Show that the two robots will meet at the same point and determine the time taken.

[3 markah / marks]

- (c) Cari koordinat titik pertemuan kedua-dua robot tersebut.

Find the coordinates of the point where the two robots meet.

[2 markah / marks]

Jawapan/*Answer*:

(a)

(b)

(c)

- 15 (a) Tanpa menggunakan kalkulator, cari nilai bagi $\cos 75^\circ$.
Without using a calculator, find the value of $\cos 75^\circ$. [4 markah / marks]
- (b) Diberi bahawa $\tan A = \frac{5}{12}$ dan $\tan B = -\frac{8}{15}$, dengan keadaan A ialah sudut tirus dan B ialah sudut refleks. Cari
It is given that $\tan A = \frac{5}{12}$ and $\tan B = -\frac{8}{15}$, such that A is an acute angle and B is a reflex angle.
Find
- (i) $\sin(A + B)$ [2 markah / marks]
- (ii) $\tan(A - B)$ [2 markah / marks]

Jawapan/Answer:

(a)

(b)