

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 ceraihan 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, $s = r\theta$
Arc length, $s = r\theta$ |
| 14 | $y = uv, \frac{dy}{dx} = u \frac{dv}{dx} + v \frac{du}{dx}$ | 28 | Luas sektor, $L = \frac{1}{2} r^2 \theta$
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*
 $= \frac{1}{2} |(x_1 y_2 + x_2 y_3 + x_3 y_1) - ((x_2 y_1 + x_3 y_2 + x_1 y_3))|$
- 43 $|\underline{r}| = \sqrt{x^2 + y^2}$
- 44 $\hat{\mathbf{r}} = \frac{x\mathbf{i} + y\mathbf{j}}{\sqrt{x^2 + y^2}}$

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

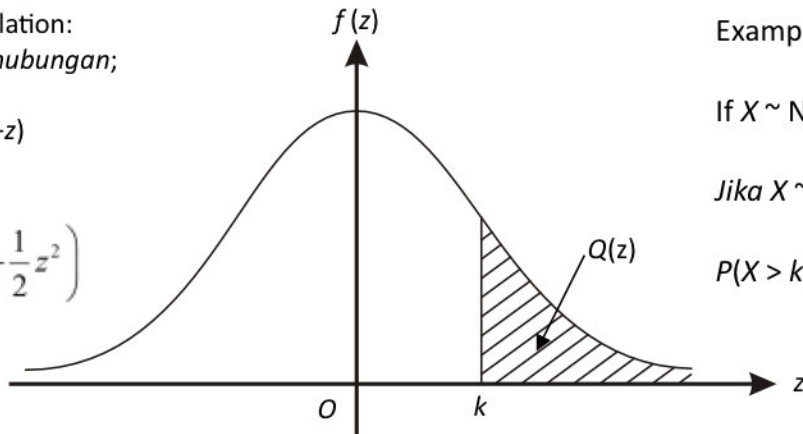
z	0	1	2	3	4	5	6	7	8	9	Minus / Tolak								
0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641	4	8	12	16	20	24	28	32	36
0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247	4	8	12	16	20	24	28	32	36
0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	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	0.00889	0.00866	0.00842	3	5	8	10	13	15	18	20	23
2.4	0.00820	0.00798	0.00776	0.00755	0.00734						2	5	7	9	12	14	16	16	21
						0.00714	0.00695	0.00676	0.00657	0.00639	2	4	6	8	11	13	15	17	19
2.5	0.00621	0.00604	0.00587	0.00570	0.00554	0.00539	0.00523	0.00508	0.00494	0.00480	2	4	6	7	9	11	13	15	17
2.6	0.00466	0.00453	0.00440	0.00427	0.00415	0.00402	0.00391	0.00379	0.00368	0.00357	2	3	5	6	8	9	11	12	14
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	5	6	7	9	9	10
2.8	0.00256	0.00248	0.00240	0.00233	0.00226	0.00219	0.00212	0.00205	0.00199	0.00193	1	2	3	4	5	6	7	8	9
2.9	0.00187	0.00181	0.00175	0.00169	0.00164	0.00159	0.00154	0.00149	0.00144	0.00139	1	1	2	3	4	4	5	6	6
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	3	3	4	4

For negative z use relation:
 Bagi z negatif guna hubungan;

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

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

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



Example / Contoh:

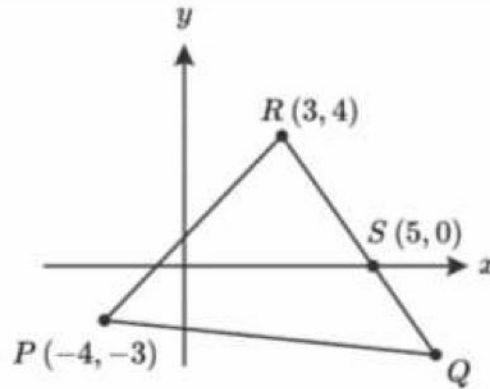
If $X \sim N(0, 1)$ then

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

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

- 1 Rajah 1 menunjukkan sebuah segi tiga PQR .

Diagram 1 shows a triangle PQR .



Rajah 1 / Diagram 1

Diberi garis RQ menyalang paksi- x pada titik S dan $RS:RQ = 3:5$, cari

Given that straight line RQ intersects x -axis at point S and $RS:RQ = 3:5$, cari

- (a) Koordinat Q ,

Coordinate of Q ,

[2 markah/marks]

- (b) Persamaan lokus bagi titik T yang bergerak supaya $TP:TS = 1:2$.

The equation of the locus of a point T which moves such that $TP:TS = 1:2$. [3 markah/marks]

Jawapan/Answer:

(a)

(b)



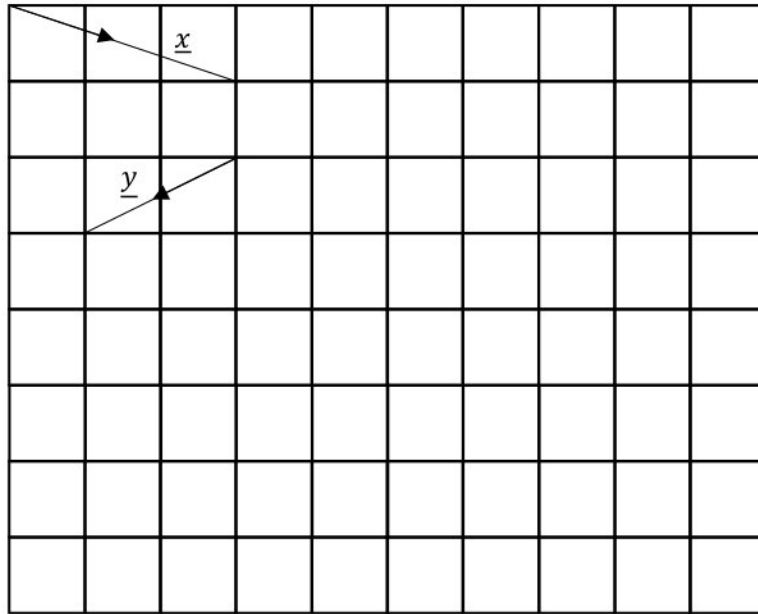
2 (a)

Sebotol air tebu dengan isi padu 1.5l diletakkan di atas meja.
A bottle of sugarcane juice with a volume of 1.5l is placed on the table.

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/1 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

Pada Rajah 2, lukis dan labelkan vektor $\underline{x} - \underline{y}$. Seterusnya, nyatakan magnitud dan arah bagi vektor $\underline{x} - \underline{y}$.

On Diagram 2, draw and label the vector of $\underline{x} - \underline{y}$. Hence, state the magnitude and the direction of the vector $\underline{x} - \underline{y}$. [3 markah / 3 marks]

- (c) Diberi suatu vektor $\underline{a} = 6\underline{i} - 3\underline{j}$. Cari vektor unit dalam arah $\underline{a}$.

Given a vector $\underline{a} = 6\underline{i} - 3\underline{j}$. Find a unit vector in direction of $\underline{a}$. [2 markah / 2 marks]

Jawapan/ Answer:

(a)

(c)

- 3 (a) Seutas tali panjang dipotong kepada beberapa bahagian dengan keadaan panjang bahagian pertama ialah $(n - 1)$ cm, panjang bahagian kedua ialah $(2n + 2)$ cm, panjang bahagian ketiga ialah $(7n + 1)$ cm dan seterusnya, dengan keadaan $n \neq 0$. Panjang setiap bahagian membentuk suatu jangjang geometri.

A piece of rope is cut into several pieces with the length of the first piece is $(n - 1)$ cm, the length of the second piece is $(2n + 2)$ cm, the length of the third piece is $(7n + 1)$ cm and so on, such that $n \neq 0$. The length of each part forms a geometric progression.

Hitung panjang bahagian tali yang pertama.

Calculate the first piece of the rope.

[3 markah/marks]

- (b) Ungkapkan perpuluhan berulang 2.5363636... dalam bentuk pecahan termudah.

Express the repeating decimals 2.5363636... in the simplest form of fraction.

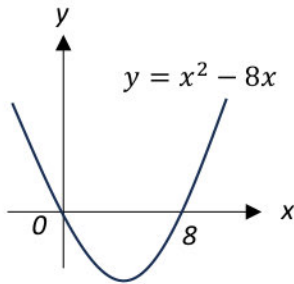
[2 markah/marks]

Jawapan/ Answer:

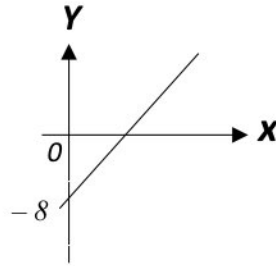
(a)

(b)

- 4 Rajah 4 (a) menunjukkan pemboleh ubah x dan y dihubungkan oleh persamaan $y = x^2 - 8x$ 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 $y = x^2 - 8x$ while 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.

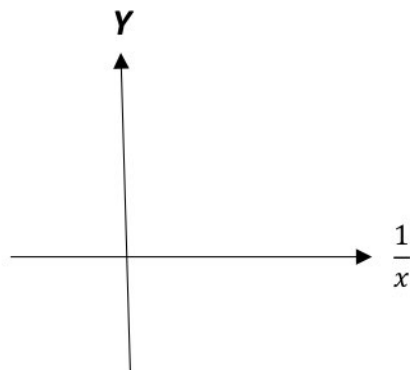
[3 markah/ marks]

[1 markah/ mark]

Jawapan/ Answer:

(a)

(b)



- 5 Satu persamaan kuadratik diberi oleh $x^2 + 3x = -4p$, dengan keadaan p ialah pemalar.
A quadratic equation is given by $x^2 + 3x = -4p$, such that p is a constant.

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

Bentukkan satu persamaan kuadratik dengan punca-punca $\alpha - \beta + 1$ dan $\beta - \alpha + 1$ dalam sebutan p .

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

Form a quadratic equation with roots $\alpha - \beta + 1$ and $\beta - \alpha + 1$ in terms of p .

[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 both axes, draw both graphs of $2y - 2x = -3$ and $y^2 - 2x = 0$ for $0 \leq x \leq 5$.

Hences, state the intersections for both graphs.

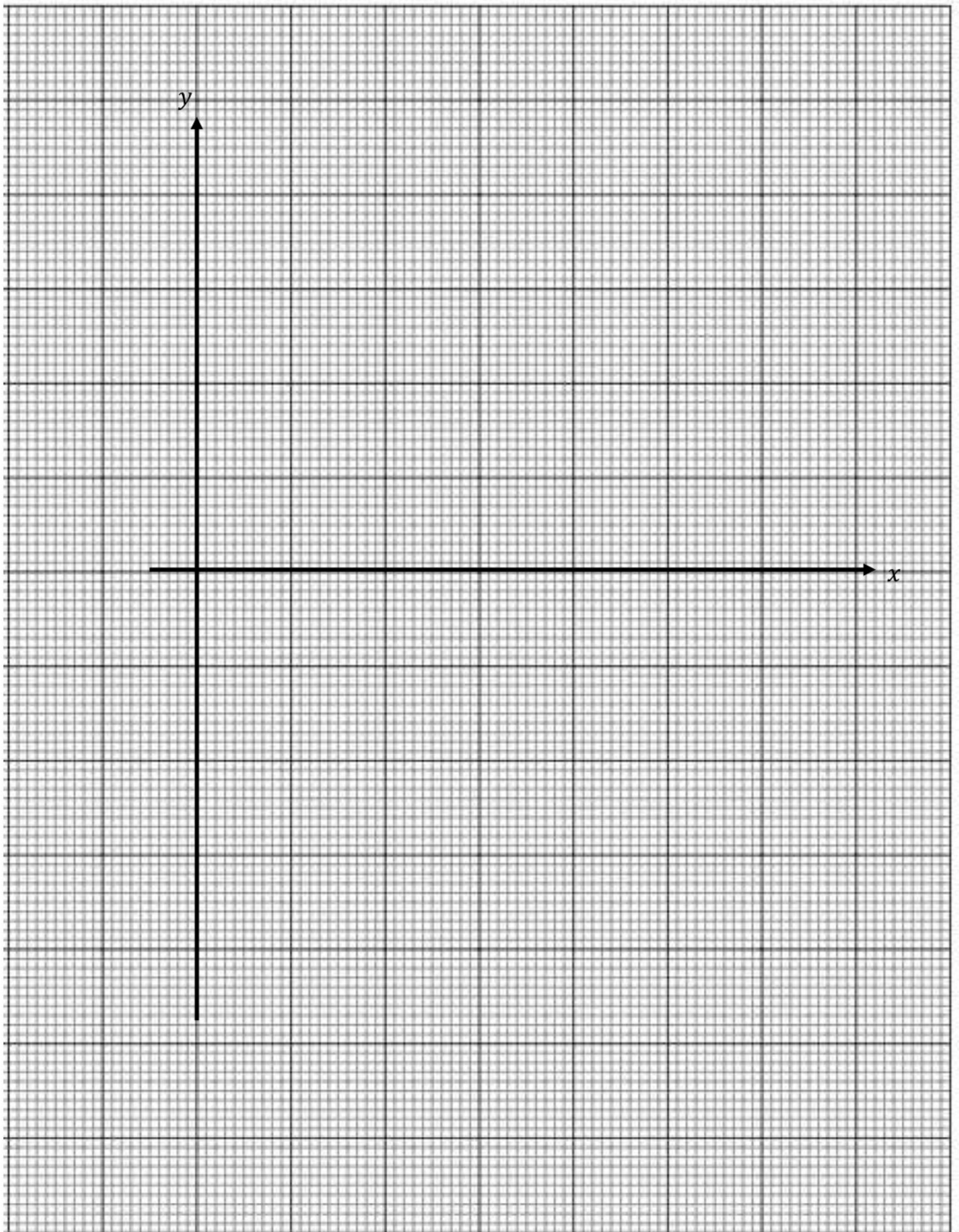
[4 markah / 4 marks]

Jawapan / Answer:

(a)

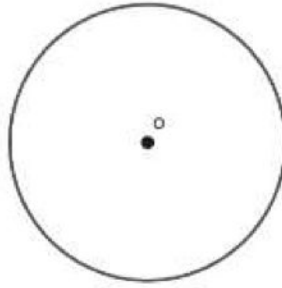
x	0	1	2	3	4	5
$2y - 2x = -3$						
$y^2 - 2x = 0$						

(b)



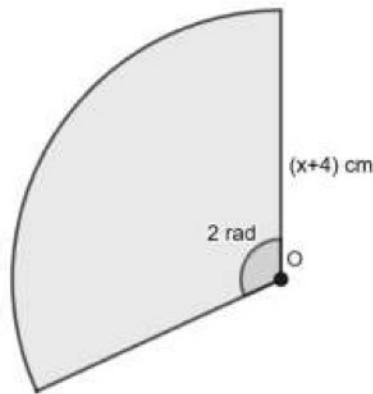
7

- (a) Diberi sebuah bulatan berpusat O mempunyai jejari r cm. Lakar dan label 1 rad dalam rajah yang diberi.
Given a circle centered at O have radius r cm. Sketch and label 1 rad in diagram given.



[1 markah/1 mark]

- (b) Rajah 7 menunjukkan sebuah sektor bulatan yang mempunyai jejari $(x+4)$ cm dan sudut pusat 2 rad.
Diagram 7 shows a sector of circle have radius $(x+4)$ cm and centered at O.



Rajah 7/Diagram 7

- (i) Cari panjang lengkok sektor tersebut dalam sebutan x .
Find the arc length of sector in term of x .
- (ii) Jika panjang lengkok ialah 28 cm, cari nilai x .
If the arc length is 28 cm, Find the value of x .

[2 markah/2 marks]

[2 markah/2 marks]

Jawapan / Answer:

(b) (i)

(ii)

8 Diberi $y = 5x - x^2$, cari $\frac{dy}{dx}$ dengan menggunakan prinsip pertama.

Given $y = 5x - x^2$, find $\frac{dy}{dx}$ by using first principles.

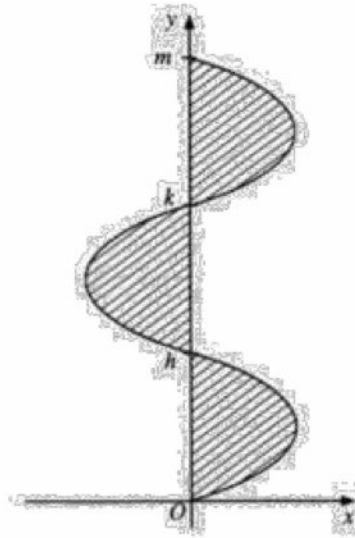
[4 markah/ 4 marks]

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 6 unit² dan $\int_0^h f(y) dy = \int_k^m f(y) dy = 2$. Cari nilai bagi

Given that the area of the shaded region is 6 unit² and $\int_0^h f(y) dy = \int_k^m f(y) dy = 2$.
Find the value of

(a) $\int_0^k f(y) dy$, . [2 markah/ 2 marks]

(b) $\int_h^k x dy + \int_k^m \frac{3}{2} f(y) dy$. [2 markah/ 2 marks]

Jawapan / Answer:

(a)

(b)

- 10 (a) Permudahkan $3^p + 3^{p+1} + 3^{p+2}$.
 Seterusnya, tentukan sama ada $3^p + 3^{p+1} + 3^{p+2}$ ialah gandaan bagi 13 bagi semua integer positif p dan berikan alasan anda.
- Simplify $3^p + 3^{p+1} + 3^{p+2}$.
 Hence, determine whether $3^p + 3^{p+1} + 3^{p+2}$ is a multiple of 13 for all positive integers and give your reason.*
- [3 markah /3 marks]
- (b) Luas sebuah segi tiga bersudut tegak ialah $\frac{7+7\sqrt{2}}{2}$ cm². Diberi panjang tapak segi tiga ialah $(3 + \sqrt{2})$ cm, cari tinggi segi tiga itu dalam bentuk $a + b\sqrt{2}$, dengan keadaan a dan b ialah nombor nisbah.
- The area of a right-angled triangle is $\frac{7+7\sqrt{2}}{2}$ cm². Given that the length of the base of the triangle is $(3 + \sqrt{2})$ cm, find the height of the triangle in the form of $(a + b\sqrt{2})$, where a and b are rational numbers.*
- [4 markah /4 marks]

Jawapan / Answer:

(a)

(b)

11

(a)

Sebuah dadu adil dilambungkan sebanyak dua kali. Hasil tambah bacaan dadu telah dicatatkan.

A fair die is rolled twice. The sum of the numbers shown on the

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/marks]

(b)

Jisim tembikai yang baru dikutip di kebun tembikai Ali mengikut taburan normal dengan min μ dan sisihan piawai σ . Diberi bahawa 2.28% buah tembikai itu mempunyai jisim kurang daripada 1.5 kg dan 25.23% buah tembikai mempunyai jisim lebih daripada 3.5 kg. Cari μ dan σ bagi jisim buah tembikai yang baru dikutip.

The mass of the freshly picked watermelons from the garden of Ali is normally distributed with a mean of μ and a standard deviation of σ . It is given that 2.28% of the watermelons mass are less than 1.5 kg and 25.23% of the watermelons mass are more than 3.5 kg. Find μ and σ of the freshly picked watermelons.

[5 markah/marks]

Jawapan / Answer:

(a)

(b)



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

Jawapan / Answer:

(a) (i)

(ii)

(b) (i)

(ii)

- 13 Diberi fungsi
Given the function

$$f(x) = |2x - 3|$$

- (a) Lakar graf fungsi $y = f(x)$ bagi domain $-2 \leq x \leq 6$
Sketch the graph of the function $y = f(x)$ for domain $-2 \leq x \leq 6$ [3 markah/marks]
- (b) Nyatakan paksi simetri dan titik minimum graf.
State the axis of symmetry and the minimum point of the graph [2 markah/marks]
- (c) Cari domain bagi $f(x) > 4$
Find the domain for $f(x) > 4$ [3 markah/marks]

Jawapan / Answer:

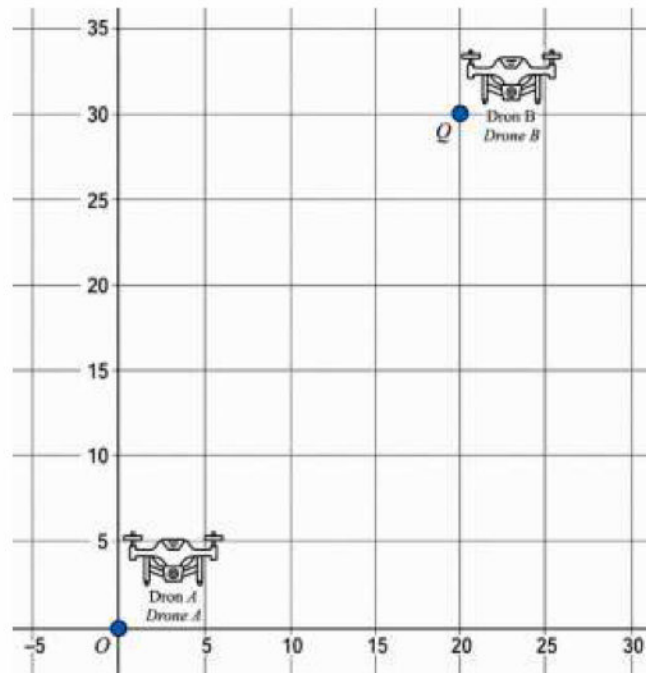
(a)

(b)

(c)



- 14 Rajah 14 menunjukkan pergerakan dua buah dron, A dan B , dalam satah Cartes.
Diagram 14 shows the movement of two drones, A and B , in a Cartesian plane.



Rajah 14 / Diagram 14

Dron A berlepas dari asalan, O dengan vektor halaju $4\mathbf{i} + 6\mathbf{j}$ unit min^{-1} .
Drone A takes off from origin, O with velocity vector $4\mathbf{i} + 6\mathbf{j}$ unit min^{-1} .

Pada masa yang sama, dron B berlepas dari titik Q dengan vektor halaju $2\mathbf{i} + 3\mathbf{j}$ unit min^{-1} .
At the same time, drone B takes off from point Q with velocity vector $2\mathbf{i} + 3\mathbf{j}$ unit min^{-1} .

Kedudukan titik Q relatif kepada asalan diberi oleh $\overrightarrow{OQ} = 20\mathbf{i} + 30\mathbf{j}$.
The position vector of point Q relative to origin is given by $\overrightarrow{OQ} = 20\mathbf{i} + 30\mathbf{j}$.

Diberi bahawa kedua-dua dron bergerak dalam arah yang tetap.
Both drones move in fixed directions.

- (a) Selepas t minit, vektor kedudukan dron A ialah $\overrightarrow{OA} = t(4\mathbf{i} + 6\mathbf{j})$.
After t minutes, the position vector of drone A is $\overrightarrow{OA} = t(4\mathbf{i} + 6\mathbf{j})$.

Cari vektor kedudukan dron B selepas t minit dalam sebutan $\mathbf{i}$, $\mathbf{j}$ dan t .
Find the position vector of drone B after t minutes in terms of $\mathbf{i}$, $\mathbf{j}$ and t .

[3 markah/marks]

- (b) Tunjukkan bahawa kedua-dua dron akan bertemu pada suatu titik yang sama dalam masa, t minit. Seterusnya tentukan nilai t .
Show that the two drones will meet at the same point at t minutes. Hence, determine the value of t .

[3 markah/marks]

- (c) Cari koordinat titik pertemuan kedua-dua dron tersebut.
Find the coordinates of the point where the two drones meet.

[2 markah/marks]

Jawapan / *Answer*:

(a)

(b)

(c)

- 15 (a) Tanpa menggunakan kalkulator, cari nilai bagi $\tan 67.5^\circ$
Without using a calculator, find the value of $\tan 67.5^\circ$. [4 markah/ marks]

(b) $\cos(\alpha + \beta) = \frac{1}{4}$ dan $\sin \alpha \sin \beta = \frac{1}{2}$.
 Diberi bahawa

Given that $\cos(\alpha + \beta) = \frac{1}{4}$ and $\sin \alpha \sin \beta = \frac{1}{2}$.

Cari nilai setiap yang berikut:
Find the value of each of the following:

(i) $\cos \alpha \cos \beta$
 $\cos \alpha \cos \beta$

[2 markah/ marks]

(ii) $\cos(\alpha - \beta)$
 $\cos(\alpha - \beta)$

[2 markah/ marks]

Jawapan / Answer:

(a)

(b) (i)

(ii)