

PEPERIKSAAN PERCUBAAN SPM TAHUN 2026
TINGKATAN 5

MATEMATIK TAMBAHAN
KERTAS 1
Dua jam

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

- 1. Tulis nama dan kelas anda pada ruang yang disediakan.
- 2. Kertas soalan ini adalah dalam dwibahasa.
- 3. Soalan dalam Bahasa Melayu mendahului soalan yang sepadan dalam Bahasa Inggeris.
- 4. Calon dibenarkan menjawab keseluruhan atau sebahagian soalan dalam Bahasa Melayu atau Bahasa Inggeris.
- 5. Kertas soalan ini mengandungi 15 soalan.
- 6. Jawab **semua** soalan di **Bahagian A** dan **2 soalan** di **Bahagian B**.
- 7. Tulis jawapan anda dalam ruangan yang disediakan dalam kertas soalan.
- 8. Tunjukkan langkah-langkah penting dalam kerja mengira anda. Ini boleh membantu anda untuk mendapatkan markah.
- 9. Satu senarai rumus disediakan di halaman 2 & 3.
- 10. Anda dibenarkan menggunakan kalkulator saintifik.

Untuk Kegunaan Pemeriksa			
	Soalan	Markah Penuh	Markah Diperolehi
BAHAGIAN A	1	5	
	2	6	
	3	5	
	4	4	
	5	6	
	6	6	
	7	5	
	8	4	
	9	4	
	10	7	
	11	6	
	12	6	
BAHAGIAN B	13	8	
	14	8	
	15	8	
	JUMLAH	80	

RUMUS FORMULAE

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.

$$1. x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$2. a^m \times a^n = a^{m+n}$$

$$3. a^m \div a^n = a^{m-n}$$

$$4. (a^m)^n = a^{mn}$$

$$5. \log_a mn = \log_a m + \log_a n$$

$$6. \log_a \frac{m}{n} = \log_a m - \log_a n$$

$$7. \log_a m^n = n \log_a m$$

$$8. \log_a b = \frac{\log_c b}{\log_c a}$$

$$9. T_n = a + (n-1)d$$

$$10. S_n = \frac{n}{2}[2a + (n-1)d]$$

$$11. T_n = ar^{n-1}$$

$$12. S_n = \frac{a(r^n-1)}{r-1} = \frac{a(1-r^n)}{1-r}, r \neq 1$$

$$13. S_\infty = \frac{a}{1-r}, |r| < 1$$

$$14. y = uv, \frac{dy}{dx} = u \frac{dv}{dx} + v \frac{du}{dx}$$

$$15. y = \frac{u}{v}, \frac{dy}{dx} = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$$

$$16. \frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$$

17. Luas di bawah lengkung

Area under a curve

$$\int_a^b y \, dx \text{ atau (or)}$$

$$\int_a^b x \, dy$$

18. Isipadu janaan

Volume of generation

$$\int_a^b \pi y^2 \, dx \text{ atau (or)}$$

$$\int_a^b \pi x^2 \, dy$$

$$19. I = \frac{Q_1}{Q_0} \times 100$$

$$20. \bar{I} = \frac{\sum w_i I_i}{\sum w_i}$$

$$21. {}^n P_r = \frac{n!}{(n-r)!}$$

$$22. {}^n C_r = \frac{n!}{(n-r)!r!}$$

$$23. P(X=r) = {}^n C_r p^r q^{n-r}, p+q=1$$

$$24. \text{Min / Mean, } \mu = np$$

$$25. \sigma = \sqrt{npq}$$

$$26. Z = \frac{X-\mu}{\sigma}$$

27. Panjang lengkok, $s = j\theta$

Arc length, $s = r\theta$

$$28. \text{Luas sektor, } A = \frac{1}{2}j^2\theta$$

$$\text{Area of sector, } A = \frac{1}{2}r^2\theta$$

$$29. \sin^2 A + \cos^2 A = 1$$

$$\sin^2 A + \cos^2 A = 1$$

$$30. \sec^2 A = 1 + \tan^2 A$$

$$\sec^2 A = 1 + \tan^2 A$$

$$31. \operatorname{cosec}^2 A = 1 + \cot^2 A$$

$$\operatorname{cosec}^2 A = 1 + \cot^2 A$$

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

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

$$33. \cos 2A = \cos^2 A - \sin^2 A$$

$$= 2 \cos^2 A - 1$$

$$= 1 - 2 \sin^2 A$$

$$\cos 2A = \cos^2 A - \sin^2 A$$

$$= 2 \cos^2 A - 1$$

$$= 1 - 2 \sin^2 A$$

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

$$35. \sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$$

$$\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$$

$$36. \cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$$

$$\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$$

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

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

$$39. a^2 = b^2 + c^2 - 2bc \cos A$$

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$40. \text{Luas segitiga / Area of triangle}$$

$$= \frac{1}{2} ab \sin C$$

$$41. \text{Titik yang membahagi suatu tembereng garis}$$

$$A \text{ point dividing a segment of a line}$$

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

$$42. \text{Luas segitiga / Area of triangle}$$

$$= \frac{1}{2} |(x_1 y_2 + x_2 y_3 + x_3 y_1) - (x_2 y_1 + x_3 y_2 + x_1 y_3)|$$

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

$$44. \hat{r} = \frac{xi+yj}{\sqrt{x^2+y^2}}$$

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	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

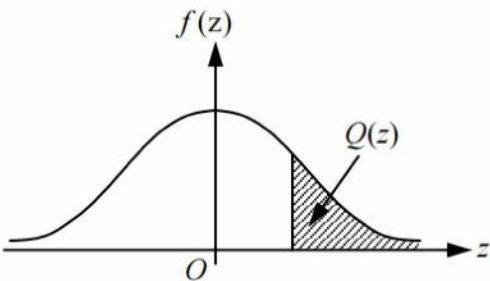
Bagi z negatif guna hubungan

For negative z use relation

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

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

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



Contoh/Example:

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 / marks]

Jawab **semua** soalan*Answer **all** questions*

1. (a) Titik-titik $D(2k, k)$, $E(h, g)$ dan $F(4h, 3g)$ terletak pada suatu garis lurus. E membahagi garis lurus DF dengan nisbah 3: 1. Ungkapkan h dalam sebutan g .

The points $D(2k, k)$, $E(h, g)$ and $F(4h, 3g)$ lie on a straight line. E divides the straight line DF in the ratio of 3 : 1. Express h in terms of g .

[2 markah/marks]

- (b) Titik $A(-2, 3)$ dan titik $B(4, 5)$ berada pada satah Cartes. Titik P bergerak supaya $\angle APB = 90^\circ$. Cari persamaan lokus bagi P .

Point $A(-2, 3)$ and point $B(4, 5)$ are on a Cartesian plane. Point P moves such that $\angle APB = 90^\circ$. Find the equation of the locus of P .

[3 markah/marks]

Jawapan / Answer :

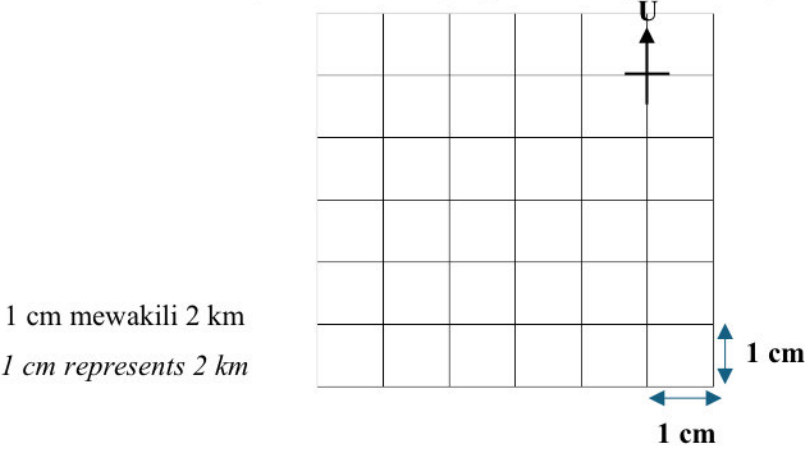
2. (a) Lengkapkan Jadual 1 di bawah.
Complete Table 1 below.

Kuantiti skala Scale quantity	Kuantiti vektor Vector quantity
	Berat Weight
Jarak Distance	

Jadual /Table 1

[1 markah/mark]

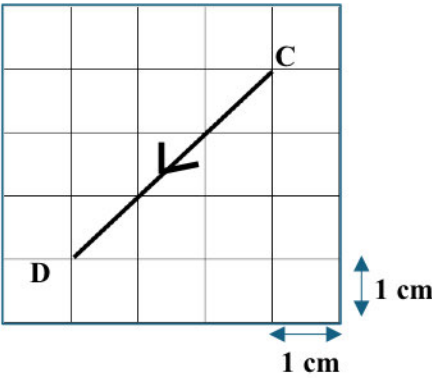
- (b) Lukis dan label vector $\overrightarrow{PQ}$. Diberi $\overrightarrow{PQ}$ mewakili sesaran 6 km ke barat.
Draw and label vector $\overrightarrow{PQ}$. Given that $\overrightarrow{PQ}$ represents displacement of 6 km to the west.



Rajah /Diagram 1

[1 markah/mark]

- (c)



Rajah /Diagram 2

Rajah 2 menunjukkan vektor $\overrightarrow{CD}$ yang mewakili sesaran suatu zarah dari titik C ke titik D.
Nyatakan $\overrightarrow{CD}$ dalam bentuk $a\hat{i} + b\hat{j}$. Seterusnya, cari magnitud dan arah bagi $\overrightarrow{CD}$.



Diagram 2 shows vector $\overrightarrow{CD}$ that represents the displacement of the particle from point C to point D, State $\overrightarrow{CD}$ in the form $a\hat{i} + b\hat{j}$. Hence, find the magnitude and the direction of $\overrightarrow{CD}$.

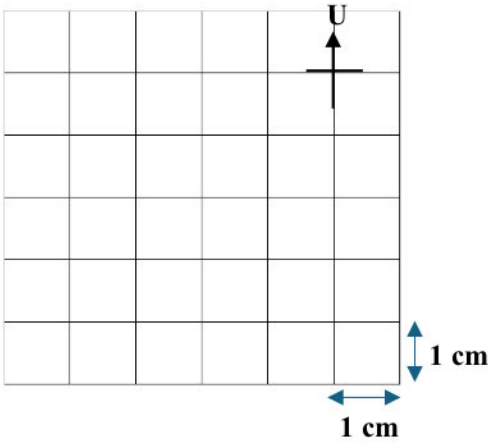
[4 markah/marks]

Jawapan / Answer :

(a)

Kuantiti skala Scale quantity	Kuantiti vektor Vector quantity
	Berat Weight
Jarak Distance	

(b)



Rajah /Diagram 1

(c)

3. (a) Diberi bahawa sebutan ke- n bagi suatu jangjang geometri ialah $T_n = \frac{2}{3}r^{n-1}, r \neq p$.

Given the n^{th} term of a geometric progression is $T_n = \frac{2}{3}r^{n-1}, r \neq p$.

Nyatakan

State

- (i) nilai p
the value of p
- (ii) sebutan pertama bagi jangjang itu
the first term of the progression

[2 markah/marks]

Jawapan / Answer :

- (b) Ungkapkan perpuluhan berulang 2.5363636... sebagai satu pecahan.

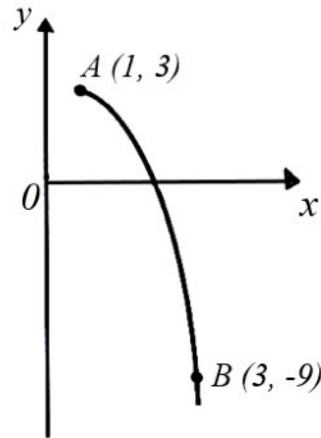
Express the following recurring decimals 2.5363636... as a fraction.

[3 markah/marks]

Jawapan / Answer :

4. Rajah 3 menunjukkan sebahagian daripada graf bagi $y = -3x^2 + 6x$ yang melalui $A(1,3)$ dan $B(3,-9)$. Pada ruang jawapan, lakarkan graf garis lurus bagi $\frac{y}{x}$ melawan x . Tunjukkan dengan jelas pintasan- x , pintasan- y , titik A dan titik B yang sepadan. Seterusnya, nyatakan kecerunan garis lurus itu.

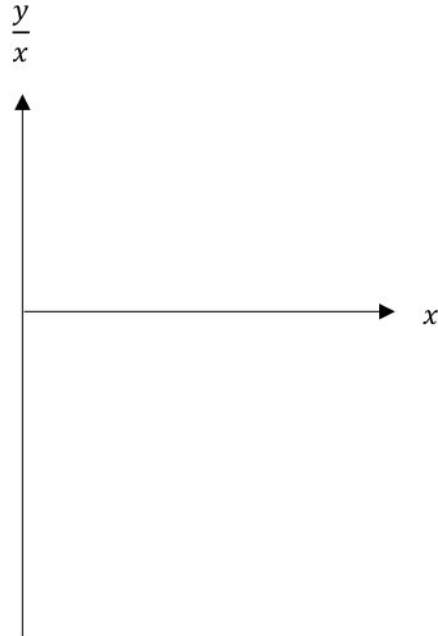
Diagram 3 shows part of the graph of $y = -3x^2 + 6x$ that passes through the point $A(1,3)$ and $B(3,-9)$. In the answer space, sketch the graph of a straight line for $\frac{y}{x}$ against x . Clearly show the x -intercept, y -intercept, corresponding point A and point B . Hence, state the gradient of the straight line.



Rajah /Diagram 3

[4 markah/marks]

Jawapan/answer:



5. (a) Punca-punca bagi persamaan $3x^2 - 2kx + k + 4 = 0$ adalah α dan β . Jika $\alpha^2 + \beta^2 = \frac{4}{9}$, cari nilai yang mungkin bagi k .

The roots of the equation $3x^2 - 2kx + k + 4 = 0$ are α and β . If $\alpha^2 + \beta^2 = \frac{4}{9}$, find the possible values of k .

[3 markah/marks]

- (b) Diberi p dan q ialah punca bagi persamaan kuadratik $5x - 1 = 3x^2$. Bentukkan persamaan kuadratik yang mempunyai punca-punca $3p$ dan $3q$.

Given p and q are the roots of the equation $5x - 1 = 3x^2$. Form a quadratic equation that has roots $3p$ and $3q$.

[3 markah/marks]

Jawapan / Answer :

6. Lengkapkan jadual nilai dalam Rajah 4. Dengan menggunakan skala 2 cm kepada 1 pada paksi-x dan 2 cm kepada 1 pada paksi-y, selesaikan persamaan serentak berikut dengan menggunakan kaedah perwakilan graf.

Complete table in the Diagram 4. By using a scale of 2cm to 1 on x-axis and 2cm to 1 on y-axis, solve the following simultaneous equations, using the graphical representation method.

$$\begin{aligned}x + y &= 3 \\ x^2 + y^2 &= 5\end{aligned}$$

<i>x</i>	-2	-1	0	1	2
Nilai <i>y</i> $(x + y = 3)$			3		
Nilai <i>y</i> $(x^2 + y^2 = 5)$				±2	

Rajah/ Diagram 4

[6 markah/marks]

Jawapan / Answer :

7. (a) Lukiskan sektor POR dan labelkan nilai sudut, dalam radian, jika nilai jejari adalah sama dengan nilai panjang lengkok PR .

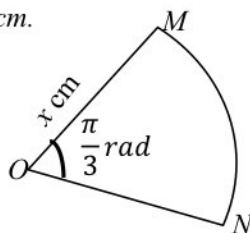
Draw a sector POR and label the value of angle, in radian, if the radius is equal to the arc PR .

[1 markah/marks]

Jawapan / Answer :

- (b) Rajah 5 menunjukkan sektor MON dengan pusat O , $\angle MON = \frac{\pi}{3}$ rad dan jejari x cm. Perimeter bagi sektor MON ialah 8 cm.

Diagram 5 shows a sector MON with a centre O , $\angle MON = \frac{\pi}{3}$ rad and radius x cm. The perimeter of the sector MON is 8 cm.



Rajah /Diagram 5

- (i) Cari nilai x , dalam sebutan π .

Find the value of x , in term of π

[2 markah/marks]

- (ii) Cari panjang lengkok MN , dalam sebutan π .

Find the length of arc MN , in terms of π .

[2 markah/marks]

Jawapan / Answer :

8. (a) Tentukan nilai had bagi fungsi $\lim_{x \rightarrow 2} (2x^2 + 1)$

Determine the limit value for $\lim_{x \rightarrow 2} (2x^2 + 1)$

[1 markah/mark]

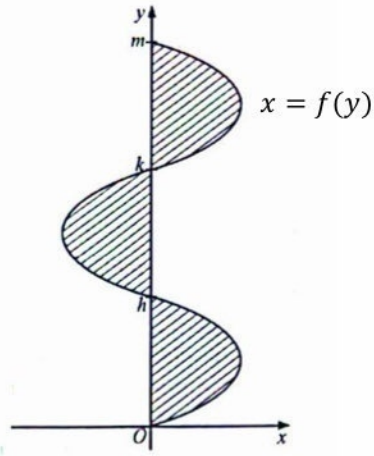
- (b) Cari $\frac{dy}{dx}$ bagi fungsi $y = 2x^2 + 1$ dengan menggunakan prinsip pertama.

Find $\frac{dy}{dx}$ for $y = 2x^2 + 1$ by using first principle.

[3 markah/marks]

Jawapan / Answer :

9.



Rajah / Diagram 6

Rajah 6 menunjukkan graf $x = f(y)$. Diberi luas kawasan berlorek adalah $\frac{15}{4}$ unit² dan

$$\int_k^m f(y) dy = \int_0^h f(y) dy = \frac{5}{4}.$$

Diagram 6 shows the graph of $x = f(y)$. Given the area of the shaded region is $\frac{15}{4}$ unit² and

$$\int_k^m f(y) dy = \int_0^h f(y) dy = \frac{5}{4}.$$

Cari nilai bagi

Find the value of

(a) $\int_h^0 f(y) dy$

[1 markah/marks]

(b) $\int_h^m f(y) dy$

[1 markah/marks]

(c) $\int_k^h f(y) dy + \int_k^m \frac{7}{3} f(y) dy$

[2 markah/marks]

Jawapan / Answer :

10. (a) Selesaikan $3^{2x} - 4(3^{x+1}) + 27 = 0$

Solve $3^{2x} - 4(3^{x+1}) + 27 = 0$

[3 markah/marks]

- (b) Sebuah kuboid mempunyai tapak segi empat sama dengan luas $(5 - \sqrt{3}) \text{ cm}^2$ dan isipadunya ialah $(82 - 12\sqrt{3}) \text{ cm}^3$. Cari tinggi kuboid dalam bentuk $a + b\sqrt{3}$.

A cuboid has a square base of area $(5 - \sqrt{3}) \text{ cm}^2$ and a volume of $(82 - 12\sqrt{3}) \text{ cm}^3$. Find the height of the cuboid in the form of $a + b\sqrt{3}$.

[4 markah/marks]

Jawapan / Answer :

11. (a) Satu kumpulan debat sekolah terdiri daripada 6 orang ahli dengan 2 daripada ahli kumpulan itu ialah lelaki. 2 orang ahli kumpulan debat itu dipilih secara rawak untuk menyertai suatu pertandingan dan X mewakili bilangan ahli kumpulan lelaki.

Nyatakan sama ada X ialah pemboleh ubah rawak diskret atau pemboleh ubah rawak selangar. Berikan justifikasi anda.

A school debate team consists of 6 people, 2 of them are boys. 2 members of the debate team are randomly selected to participate in a contest and X represents the number of boys being selected. State whether X is a discrete random variable or a continuous random variable. Give your justification.

[1 markah/mark]

- (b) Markah murid dalam Tingkatan 5 Cemerlang bagi ujian Matematik adalah mengikut taburan normal dengan min, μ , dan sisihan piawai, σ . 40% daripada murid tersebut memperoleh kurang

daripada 45 markah dan 20% daripada murid tersebut memperoleh lebih daripada 65 markah. Tentukan nilai bagi μ dan σ .

The marks of students in Form 5 Cemerlang in Mathematics test are normally distributed with mean, μ , and standard deviation, σ . 40% of the students obtained less than 45 marks and 20% of the students had more than 65 marks. Determine the values of μ and σ .

[5 markah/marks]

Jawapan / Answer :

12. (a) (i) Digit-digit 1,2,3,4,5,6,7 dan 8 disusun dalam satu bulatan. Cari bilangan cara menyusun jika semua digit ganjil mesti bersama.

The digits 1,2,3,4,5,6,7 and 8 are arranged in a circle. Find the number of ways to arrange them if all the odd digits must be together.

[1 markah/mark]

- (ii) Huruf-huruf dalam perkataan di bawah disusun semula. Cari bilangan susunan jika semua huruf A mesti bersama-sama.

The letters in the word below are to be rearranged. Find number of arrangements if all the letter A are kept together.

Y	A	Y	A	S	A	N
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[2 markah/marks]

Jawapan / Answer :

- (b) Dini menyediakan hadiah hari jadi untuk adiknya. Hadiahnya mengandungi 5 item yang dipilih daripada 6 alat tulis dan 7 buku cerita. Berapa bilangan cara hadiah tersebut dapat dipilih jika
- Dini is preparing birthday present for his brother. His present consists of 5 items chosen from 6 stationery items and 7 story books. How many ways can the present be chosen if*
- (i) hanya satu alat tulis dipilih.
only one stationery is chosen
 - (ii) bilangan buku cerita lebih daripada alat tulis.
the number of storybooks more than stationery.

[3 markah/marks]

Jawapan / Answer :

Bahagian B / Section B

[16 markah / marks]

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

13. (a) Diberi bahawa $f(x) = px + q$ dan $f^3(x) = 8x + 14$. Cari nilai p dan q .
Given that $f(x) = px + q$ and $f^3(x) = 8x + 14$. Find the value of p and q .

[3 markah/marks]

- (b) Suatu fungsi f ditakrifkan oleh $f(x) = |x - 3|$ untuk domain $-1 \leq x \leq 7$.
Function f is defined by $f(x) = |x - 3|$ for the domain $-1 \leq x \leq 7$.

- (i) Lakarkan graf f dan nyatakan julat bagi f .
Sketch the graf of f and state the range of f .

[3 markah/marks]

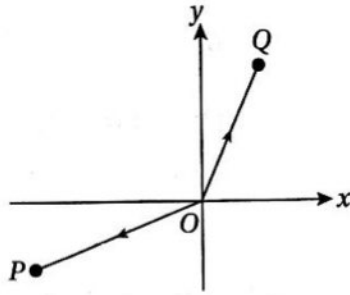
- (ii) Cari domain bagi $f(x) \leq 2$.
Find the domain for $f(x) \leq 2$

[2 markah/marks]

Jawapan / Answer :

14. (a) Dalam Rajah 14, $\overrightarrow{OP} = -6\hat{i} + 2\hat{j}$ dan $\overrightarrow{OQ} = 3\hat{i} + 7\hat{j}$.

In Diagram 14, $\overrightarrow{OP} = -6\hat{i} + 2\hat{j}$ dan $\overrightarrow{OQ} = 3\hat{i} + 7\hat{j}$.



Rajah/Diagram 14

Tentukan / Determine

- (i) $\overrightarrow{PQ}$
- (ii) vektor unit dalam arah $\overrightarrow{PQ}$.
the unit vector in the direction of $\overrightarrow{PQ}$.

[4 markah/marks]

Jawapan / Answer :



- (b) Kereta A meninggalkan bandar O dengan halaju $V_A = \begin{pmatrix} 6\hat{i} + 8\hat{j} \end{pmatrix} \text{ km } \text{ s}^{-1}$. Pada masa yang sama, kereta B meninggalkan bandar $C(100,40)$ dengan halaju $V_B = \begin{pmatrix} -4\hat{i} + 4\hat{j} \end{pmatrix} \text{ km } \text{ s}^{-1}$. Cari masa apabila kereta A akan memintas kereta B .

Car A left town O with velocity of $V_A = \begin{pmatrix} 6\hat{i} + 8\hat{j} \end{pmatrix} \text{ km } \text{ h}^{-1}$. At the same time, car Q left town C (100,40) with velocity of $V_B = \begin{pmatrix} -4\hat{i} + 4\hat{j} \end{pmatrix} \text{ km } \text{ h}^{-1}$. Find the time when the car A will overtake the car B.

[4 markah/marks]

Jawapan / Answer :

15. (a) Diberi bahawa $\cos A = -\frac{12}{13}$ dan $\tan B = \frac{3}{4}$, dengan keadaan A ialah sudut cakah dan B ialah sudut tirus.

Given that $\cos A = -\frac{12}{13}$ and $\tan B = \frac{3}{4}$, where A is an obtuse angle and B is an acute angle.

Cari/Find

(i) $\tan A$

[2 markah/marks]

(ii) $\cos (A - B)$

[2 markah/marks]

Jawapan / Answer :

- (b) Tanpa guna kalkulator, buktikan bahawa $2 \cos(p + 45^\circ) \cos(p - 45^\circ) = \cos 2p$.

Without using a calculator, prove that $2 \cos(p + 45^\circ) \cos(p - 45^\circ) = \cos 2p$.

[4 markah/marks]

Jawapan / Answer :

TAMAT KERTAS SOALAN
END OF QUESTION PAPER