

NAMA:

TINGKATAN:



MAJLIS PENGETUA SEKOLAH MALAYSIA (MPSM)
NEGERI PERAK

MODUL KECEMERLANGAN
TINGKATAN 5

MATEMATIK TAMBAHAN

KERTAS 1
2 JAM

JANGAN BUKA MODUL INI SEHINGGA DIBERITAHU

ARAHAN:

1. Tulis nama dan tingkatan anda pada ruang yang disediakan.
2. Modul ini mengandungi 2 bahagian: **Bahagian A dan Bahagian B.**
3. Jawapan hendaklah ditulis pada ruangan jawapan yang disediakan di dalam modul ini.
4. Modul ini adalah dalam dwibahasa.
5. Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Melayu atau bahasa Inggeris.
6. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
7. Kerja mengira perlu ditunjukkan.
8. Jadual Kebarangkalian Hujung Atas $Q(z)$ Bagi Taburan Normal $N(0,1)$ disediakan di halaman 4.
9. Modul ini hendaklah diserahkan kepada pengawas peperiksaan pada akhir peperiksaan.

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

Kertas modul ini mengandungi 32 halaman bercetak.



SENARAI RUMUS

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

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

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

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

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

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

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

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

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

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

$$11 \quad T_n = ar^{n-1}$$

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

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

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

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

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

$$17 \quad \text{Luas di bawah lengkung} \\ \text{Area under a curve}$$

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

$$18 \quad \text{Isi padu kisaran} \\ \text{Volume of revolution}$$

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

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

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

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

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

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

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

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

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

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

$$27 \quad \text{Panjang lengkok, } s = j\theta \\ \text{Arc length, } s = r\theta$$

$$28 \quad \text{Luas Sektor, } L = \frac{1}{2} j^2 \theta \\ \text{Area of sector, } A = \frac{1}{2} r^2 \theta$$

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

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

$$31 \quad \csc^2 A = 1 + \cot^2 A \\ \csc^2 A = 1 + \cot^2 A$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$40 \quad \text{Luas segi tiga / Area of triangle}$$

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

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

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

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

$$42 \quad \text{Luas segi tiga / Area of triangle}$$

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

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

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

**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	Tolak / Minus								
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	5	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

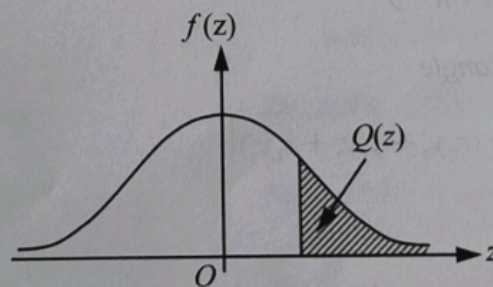
Bagi z negatif guna hubungan:

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:

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

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

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

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

Bahagian A
Section A

[64 markah]
[64 marks]

Jawab semua soalan.
Answer all questions.

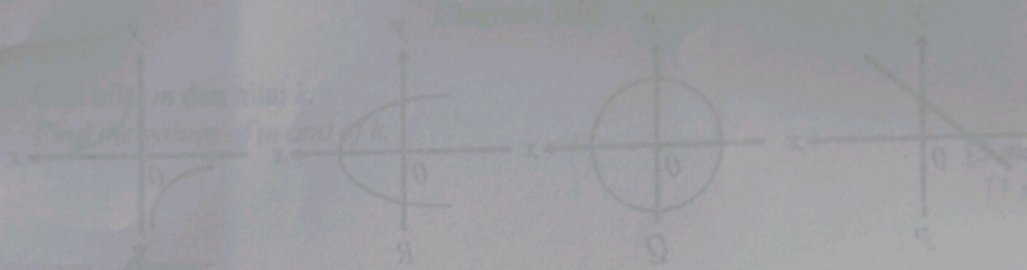
- 1 Diberi $(x - 3)^2 - 14 = -7(x - 1)$
Given $(x - 3)^2 - 14 = -7(x - 1)$

- (a) Cari pembeza layan dan tentukan jenis punca persamaan tersebut.
Find the discriminant and determine the type of roots of the equation.

[3 markah]

[3 marks]

Jawapan / Answer:



- (b) Cari julat nilai x bagi $(x - 3)^2 - 14 \geq -7(x - 1)$ dengan menggunakan kaedah garis nombor.
Find range value of x for $(x - 3)^2 - 14 \geq -7(x - 1)$ by using the number line method.

[3 markah]

[3 marks]

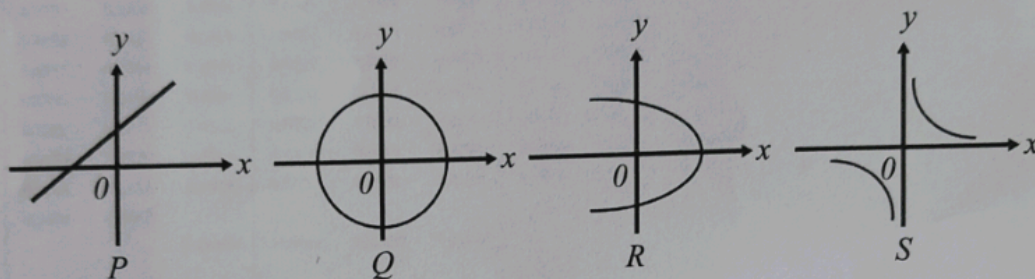
Jawapan / Answer:

- 2 (a) Diberi fungsi $f(x) = 3x - 2$, cari $f^{-1}(x)$ dan seterusnya tentusahkan bahawa $f^{-1}(x)$ yang diperoleh ialah songsangan bagi $f(x) = 3x - 2$.
 Given function $f(x) = 3x - 2$, find $f^{-1}(x)$ and hence, verify that $f^{-1}(x)$ obtained is the inverse function of $f(x) = 3x - 2$.

[4 markah]

[4 marks]

- (b) Rajah 1(a) di bawah menunjukkan empat graf P , Q , R dan S .
 Diagram 1(a) shows four graphs P , Q , R and S .



Rajah 1(a)
 Diagram 1(a)

Nyatakan graf-graf yang mempunyai fungsi songsang dan beri sebab kepada jawapan anda.

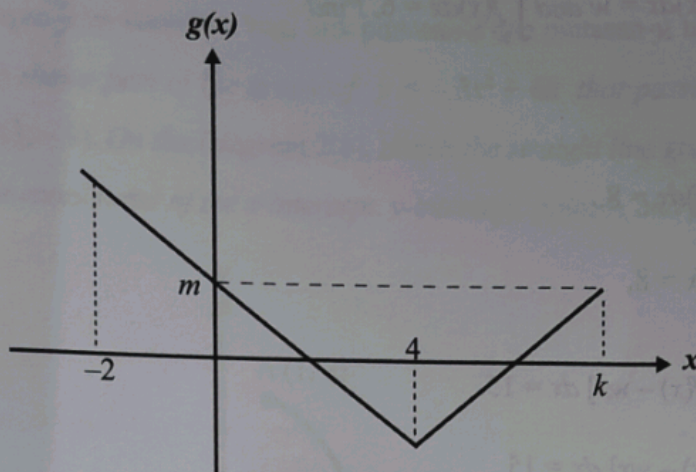
State the graph which has/have inverse function and give a reason for your answer.

[3 markah]

[3 marks]

Jawapan / Answer:

- (c) Rajah 1(b) menunjukkan graf bagi fungsi $g(x) = |-x + 4| - 2$ untuk domain $-2 \leq x \leq k$.
 Diagram 1(b) shows the graph of the function $g(x) = |-x + 4| - 2$ for the domain $-2 \leq x \leq k$.



Rajah 1(b)
 Diagram 1(b)

Cari nilai m dan nilai k .
 Find the values of m and of k .

[3 markah]
 [3 marks]

Jawapan / Answer:

3 Diberi bahawa $\int_1^2 f(x) dx = w$ dan $\int_2^4 f(x) dx = 6$. Cari

Given that $\int_1^2 f(x) dx = w$ and $\int_2^4 f(x) dx = 6$. Find

(a) $\int_4^2 f(x) dx$,

(b) w jika $\int_1^4 f(x) dx = 8$,

w if $\int_1^4 f(x) dx = 8$,

(c) w jika $\int_1^2 [4f(x) - wx] dx = 15$.

w if $\int_1^2 [4f(x) - wx] dx = 15$.

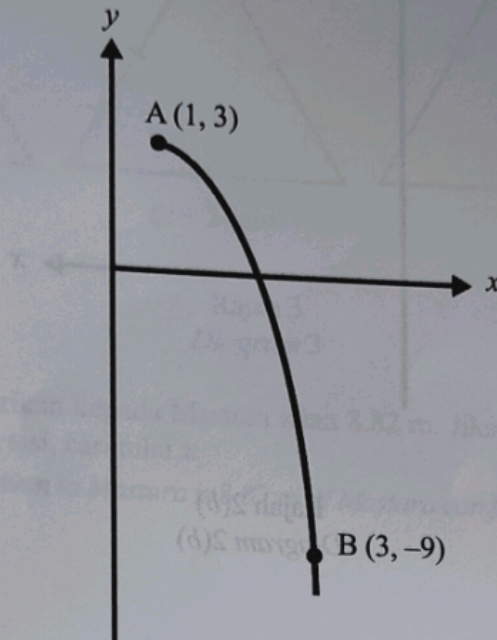
[6 markah]

[6 marks]

Jawapan / Answer:

- 4 Rajah 2(a) menunjukkan sebahagian daripada graf bagi $y = -3x^2 + 6x$ yang melalui titik $A(1, 3)$ dan $B(3, -9)$. Pada Rajah 2(b), lakarkan graf garis lurus bagi $\frac{y}{x}$ melawan x , dan tunjukkan dengan jelas koordinat bagi titik pintasan- x dan pintasan- y , titik A dan titik B.

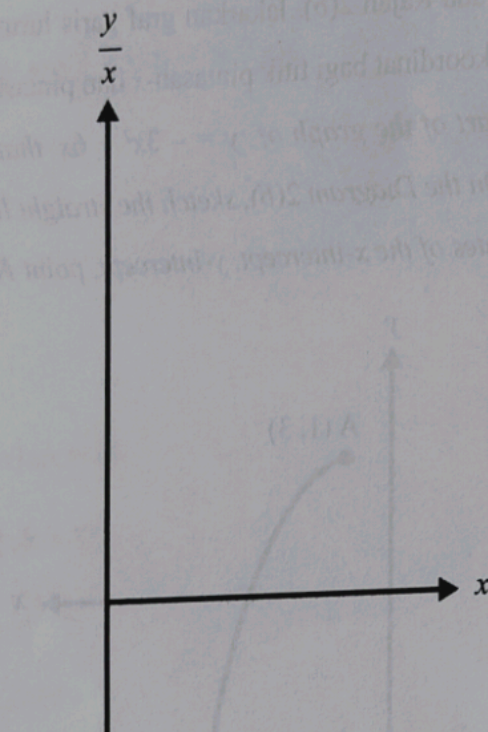
Diagram 2(a) shows part of the graph of $y = -3x^2 + 6x$ that passes through the point $A(1, 3)$ and $B(3, -9)$. On the Diagram 2(b), sketch the straight line graph of $\frac{y}{x}$ against x , and shows the coordinates of the x -intercept, y -intercept, point A and point B clearly.



Rajah 2(a)
Diagram 2(a)

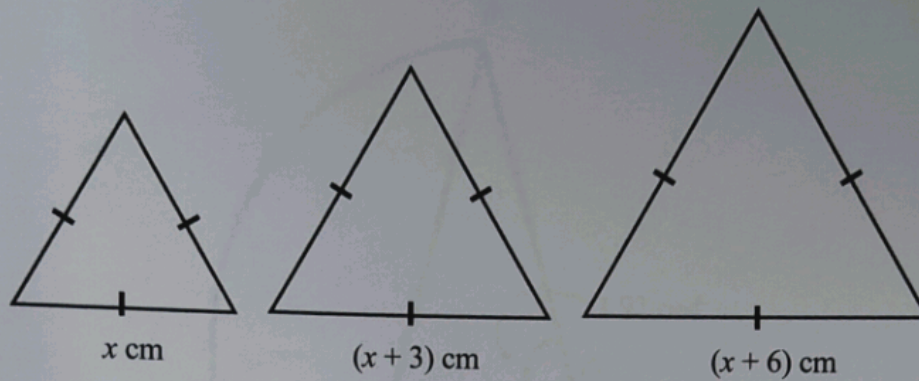
[4 markah]
[4 marks]

Jawapan / Answer:



Rajah 2(b)
Diagram 2(b)

- 5 Rajah 3 di bawah menunjukkan tiga buah segi tiga sama sisi yang pertama yang dibentuk oleh Mastura dengan menggunakan seutas tali.
 Diagram 3 below shows the first three equilateral triangles that were formed by Mastura using a piece of rope.



Rajah 3
 Diagram 3

Panjang tali yang diberikan kepada Mastura ialah 8.82 m. Jika Mastura dapat membentuk 12 buah segi tiga sama sisi, cari nilai x .

The length of the rope given to Mastura is 8.82 m. If Mastura can form 12 equilateral triangles, find the value of x .

[5 markah]

[5 marks]

Jawapan / Answer:

RUANGAN JAWAPAN SOALAN 5 / ANSWER SPACE FOR QUESTION 5

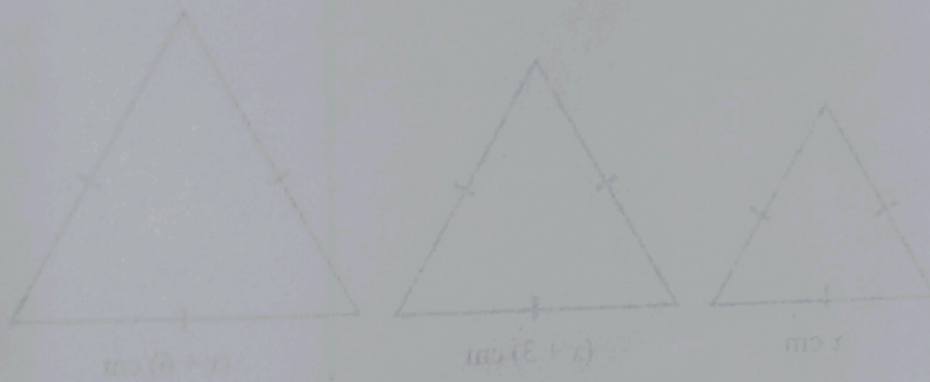
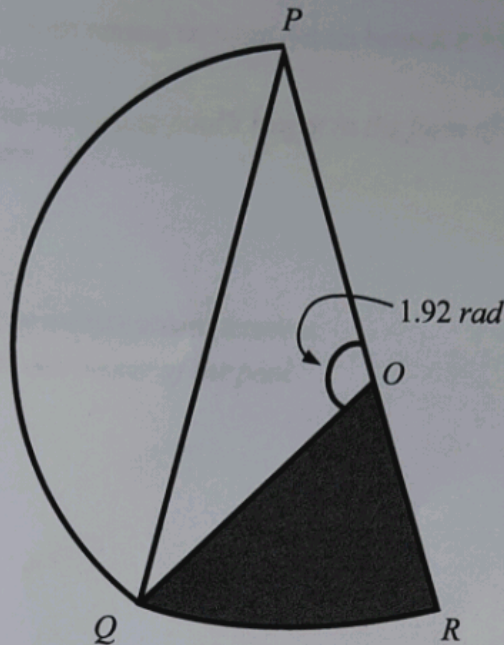


Diagram 3
Rajah 3

Panjang sisi yang diberikan kepada Mustafa ialah 8.82 m. Jika Mustafa dapat membina 12 buah segi tiga sama sisi, cari nilai x .
The length of the side given to Mustafa is 8.82 m. If Mustafa can form 12 equilateral triangles, find the value of x .

[2 marks]
[2 marks]

- 6 Rajah 4 di bawah menunjukkan sektor PQR berpusat P dan sektor POQ berpusat O .
 Diberi $OP = 8$ cm dan $\angle POQ = 1.92$ rad.
 Diagram 4 below shows sector PQR with centre P and another sector POQ with centre O .
 Given that $OP = 8$ cm and $\angle POQ = 1.92$ rad.



Rajah 4
Diagram 4

Guna / use $\pi = 3.142$

Cari / Find

- (a) panjang garis lurus PQ , dalam cm,
the length of the straight line PQ , in cm,

[2 markah]
[2 marks]

- (b) perimeter, dalam cm, kawasan berlorek.
perimeter, in cm, of the shaded region.

[2 markah]
[2 marks]

Jawapan / Answer:

RUANGAN JAWAPAN SOALAN 6 / ANSWER SPACE FOR QUESTION 6

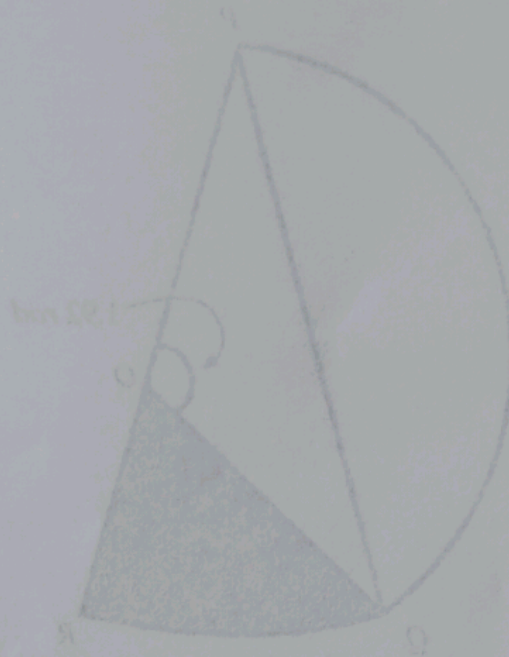


Diagram 1

- (a) Find the length of the arc QR in cm.

[2 marks]
[2 marks]

- (b) Find the area of the shaded region in cm².

[2 marks]
[2 marks]

- 7 Sebuah kolam renang berbentuk segi empat tepat mempunyai lebar $5 - \sqrt{7}$ meter dan panjang $\frac{3 + \sqrt{7}}{5 - \sqrt{7}}$ meter.

A rectangular swimming pool has a width of $5 - \sqrt{7}$ metres and a length of $\frac{3 + \sqrt{7}}{5 - \sqrt{7}}$ metres.

- (a) Cari nilai panjang kolam renang tersebut dalam bentuk $a + b\sqrt{7}$ dengan keadaan a dan b ialah nombor nisbah.

Find the value of the swimming pool's length in the form of $a + b\sqrt{7}$ such that a and b are rational numbers.

[3 markah]

[3 marks]

- (b) Seterusnya, hitung perimeter kolam tersebut.

Hence, calculate the perimeter of the pool.

[3 markah]

[3 marks]

Jawapan / Answer:

RUANGAN JAWAPAN SOALAN 7 / ANSWER SPACE FOR QUESTION 7

(a) Cari nilai perimeter kolam renang tertentu dalam bentuk $a\sqrt{b}$ dengan a dan b ialah nombor bulat. (Find the value of the swimming pool's length to the form of $a\sqrt{b}$ such that a and b are rational numbers.)

[3 marks]

[3 mark]

(b) Sekiranya, hitung perimeter kolam renang. (Hence, calculate the perimeter of the pool.)

[3 marks]

[3 marks]

- 8 Sebuah robot bergerak dalam arah vektor $\underline{r} = \begin{pmatrix} 5 \\ 12 \end{pmatrix}$. Jurutera ingin mengarahkan robot ke arah yang sama tetapi dengan kelajuan tetap sebanyak 1 unit/saat.

A robot moves in the direction of the vector $\underline{r} = \begin{pmatrix} 5 \\ 12 \end{pmatrix}$. An engineer wants to direct the robot in the same direction but at a constant speed of 1 unit/second.

- (a) Tentukan vektor unit dalam arah pergerakan robot.

Find the unit vector in the direction of the robot's movement.

[3 markah]

[3 marks]

- (b) Selepas 4 saat, berapakah jarak robot tersebut?

After 4 seconds, how far has the robot moved?

[2 markah]

[2 marks]

Jawapan / Answer:

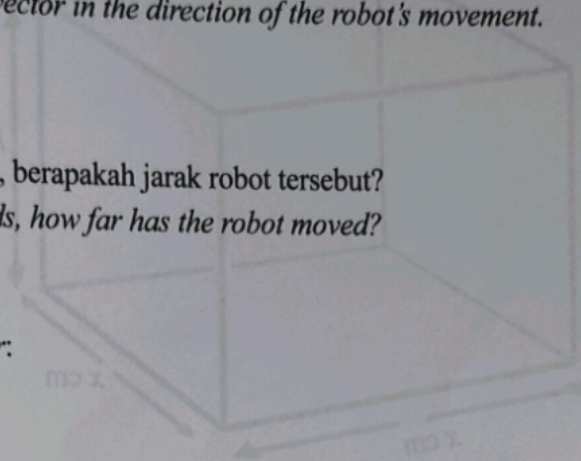
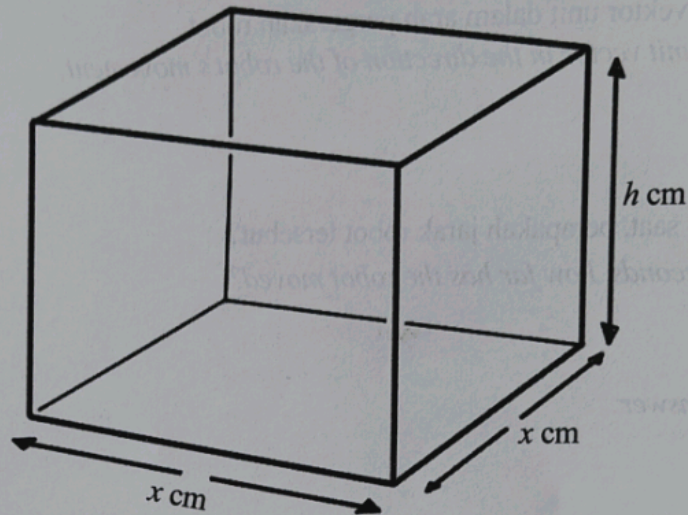


Diagram 5

[4 markah]
[4 marks]

- 9 (a) Rajah 5 menunjukkan seorang pengilang ingin mereka bentuk sebuah kotak tanpa penutup yang mempunyai tapak berbentuk segi empat sama dan jumlah luas permukaan ialah 108 cm^2 . Apakah dimensi (ukuran) yang akan menghasilkan isi padu maksimum? *Diagram 5 shows a manufacturer wants to design an open box having a square base and a surface area of 108 cm^2 . What dimensions will produce a box with maximum volume?*



Rajah 5
Diagram 5

Jawapan / Answer:

[4 markah]
[4 marks]

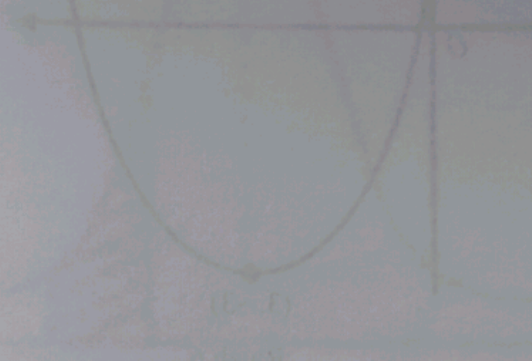
- (b) Diberi bahawa $y = 3x^2 + 4x - 2$, cari nilai $\frac{dy}{dx}$ apabila $x = 2$ dan seterusnya, tentukan nilai hampir bagi y apabila x menyusut daripada 2 kepada 1.99.

Given $y = 3x^2 + 4x - 2$, find the value of $\frac{dy}{dx}$ when $x = 2$ and hence, determine the approximate value of y when x decreases from 2 to 1.99.

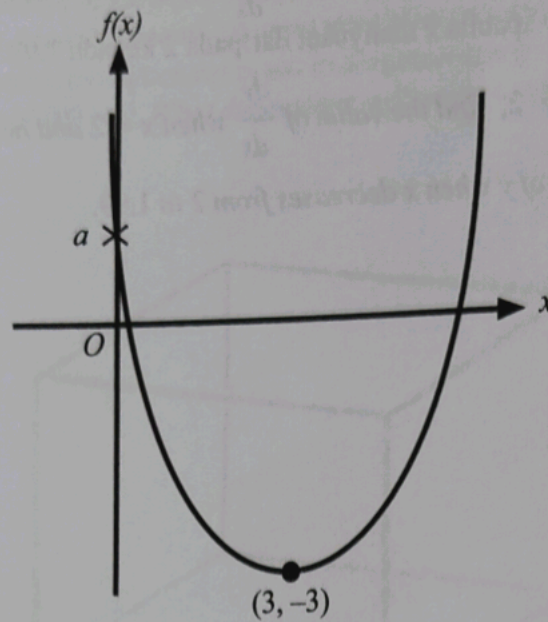
[3 markah]

[3 marks]

Jawapan / Answer:



10



Rajah 6
Diagram 6

Rajah 6 menunjukkan graf bagi $f(x) = (x - b)^2 + c$
Diagram 6 shows the graph for $f(x) = (x - b)^2 + c$

- (a) Cari nilai a .
Find the value of a .

[1 markah]
[1 mark]

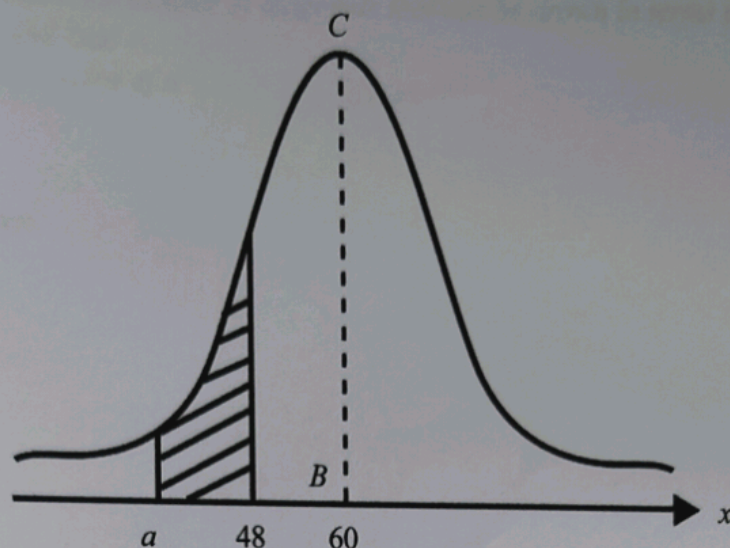
- (b) Buat generalisasi tentang kesan perubahan nilai paksi simetri yang baru, iaitu $x = -3$ terhadap bentuk dan kedudukan graf.
Make a generalization about the effect of change in the value of the new axis of symmetry, $x = -3$ on the shape and position of the graph.

[2 markah]
[2 marks]

Jawapan / Answer:

- 11 Rajah 7 menunjukkan graf taburan kebarangkalian bagi suatu pemboleh ubah rawak X , $X \sim N(\mu, 144)$.

Diagram 7 shows a probability distribution graph for a random variable X , $X \sim N(\mu, 144)$.



Rajah 7
Diagram 7

Diberi bahawa BC adalah paksi simetri bagi graf itu.
It is given that BC is the axis of symmetry of the graph.

- (a) Jika skor z yang diperoleh dengan menyeragamkan nilai a ialah -1.5 , cari nilai a .
If the z -score obtained by standardising the value of a is -1.5 , find the value of a .

[2 markah]

[2 marks]

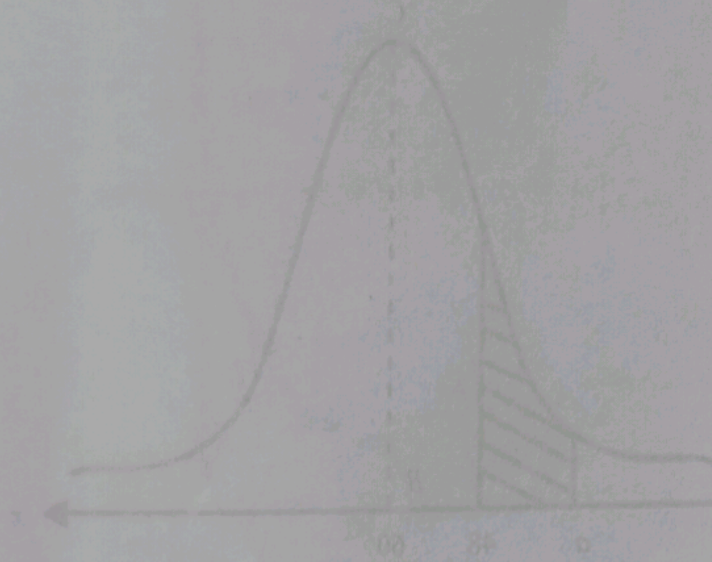
- (b) Seterusnya, cari luas kawasan berlorek.
Hence, find the area of the shaded region.

[2 markah]

[2 marks]

Jawapan / Answer:

RUANGAN JAWAPAN SOALAN 11 / ANSWER SPACE FOR QUESTION 11



In a polygon with n vertices, the number of diagonals that can be drawn is $5n$.

- (i) Tentukan bilangan pepenjuru yang boleh dilukis dalam sebutan n .
Determine the number of diagonals that can be drawn in terms of n .
- (ii) Cari nilai bagi n .
Find the value of n .

[4 markah]

- (b) Encik Razid membeli 6 rak pasu bunga dua tingkat, seperti yang ditunjukkan dalam Rajah 8, untuk menyusun pasu bunga di rumahnya. Dia mempunyai 12 pasu bunga. Jadual 1 menunjukkan berat 12 buah pasu yang perlu disusun di atas rak-rak tersebut. Mr. Razid bought 6 two-tier flower pot racks, as shown in Diagram 8, to arrange flower pots at her home. He has 12 flower pots. Table 1 shows the weight of the 12 flower pots that need to be arranged on the racks.



Rajah 8
Diagram 8

Pasu Bunga Flower Pot	A	B	C	D	E	F	G	H	I	J	K	L
Berat (kg) Weight (kg)	4.8	3.2	2.1	1.8	4.7	5.1	2.9	4.5	2.3	3.9	4.2	2.5

Jadual 1
Table 1

Cari bilangan cara berlainan untuk menyusun pasu bunga tersebut jika,
Find the number of different ways to arrange the flower pots if,

- tanpa syarat dikenakan,
there is no restriction,
- pasu-pasu bunga yang beratnya melebihi 4.5 kg diletakkan di aras bawah rak pasu bunga dan pasu bunga A dan B perlu disusun dalam rak yang sama.
flower pots weighing more than 4.5 kg are placed on the lower level of flower pot racks, and flower pot A and B must be arranged on the same rack.

[3 markah]

[3 marks]

Jawapan / Answer:

RUANGAN JAWAPAN SOALAN 12 / ANSWER SPACE FOR QUESTION 12



Diagram 9

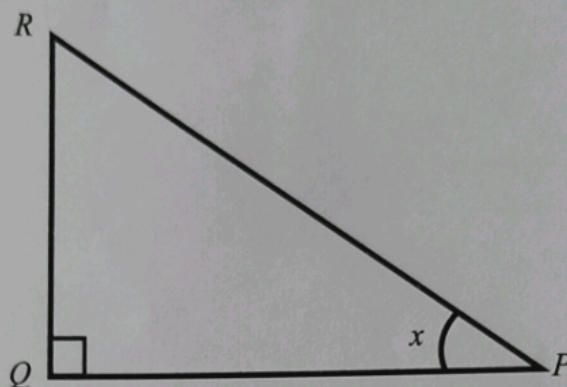
[3 marks]
[3 marks]

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 9 di bawah menunjukkan sebuah segitiga PQR bersudut tegak di Q . Diberi $PQ = 12$ cm dan $QR = 5$ cm, tentukan nilai bagi kosek x .
Diagram 9 below shows a right-angled triangle PQR at Q . Given $PQ = 12$ cm and $QR = 5$ cm, determine the value of cosec x .



Rajah 9
Diagram 9

[3 markah]
[3 marks]

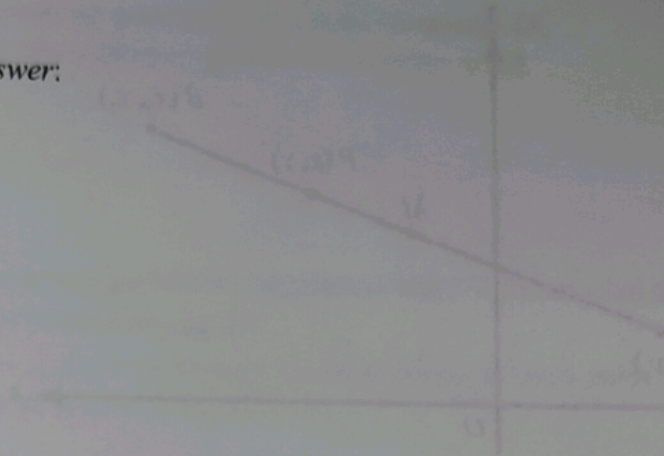
Jawapan / Answer:

- (b) Selesaikan persamaan $\cos 2x + 2 \sin x = \sin^2 x$ untuk $0^\circ \leq x \leq 360^\circ$.
 Solve the equation $\cos 2x + 2 \sin x = \sin^2 x$ for $0^\circ \leq x \leq 360^\circ$.

Jawapan / Answer:

[5 markah]

[5 marks]



Diberi bahawa koordinat titik $P(x, y)$ yang membahagi nisbah $m:n$ antara titik $A(x_1, y_1)$ dan titik $B(x_2, y_2)$ dengan nisbah $m:n$ ialah:

Given that the coordinates of point $P(x, y)$ which divides the line segment joining points $A(x_1, y_1)$ and $B(x_2, y_2)$ in the ratio $m:n$ is:

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

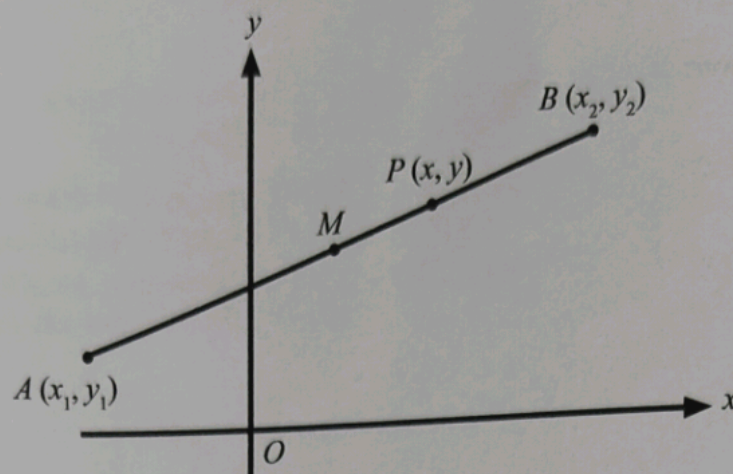
Dengan menggunakan rumus pembahagi nisbah $m:n$ di atas, turunkan formula bagi mencari titik tengah bagi dua titik $A(x_1, y_1)$ dan $B(x_2, y_2)$ yang disambungkan oleh satu garis.

By using the formula for division of a line segment AB from the above, show that the midpoint of the segment AB which is represented by M is:

$$M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

[5 markah]
 [5 marks]

- 14 (a) Rajah 10 menunjukkan suatu tembereng garis AB .
Diagram 10 shows a line segment AB .



Rajah 10
 Diagram 10

Diberi bahawa koordinat titik $P(x, y)$ yang membahagi tembereng garis yang menyambungkan titik $A(x_1, y_1)$ dan titik $B(x_2, y_2)$ dengan nisbah $m : n$ ialah:

Given that the coordinates of point $P(x, y)$ which divides the line segment joining points $A(x_1, y_1)$ and $B(x_2, y_2)$ in the ratio $m : n$ is:

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

Dengan menggunakan rumus pembahagi tembereng garis AB di atas, tunjukkan bahawa titik tengah bagi tembereng garis AB yang diwakili oleh M ialah:

By using the formula for divisor of a line segment AB from the above, show that the midpoint of line segment AB which is represented by M is:

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

[2 markah]

[2 marks]

(b) Diberi bahawa $A(-3, 1)$ dan $B(9, 9)$, cari

Given that $A(-3, 1)$ and $B(9, 9)$, find

- (i) persamaan pembahagi dua sama serenjang AB ,
the equation of perpendicular bisector of AB ,

[3 markah]

[3 marks]

- (ii) persamaan garis lurus yang melalui titik $(-2, 3)$ dan selari dengan garis pembahagi dua sama serenjang AB .

the equation of straight line that passes through point $(-2, 3)$ and parallel to perpendicular bisector of AB .

[2 markah]

[2 marks]

Jawapan / Answer:

RUANGAN JAWAPAN SOALAN 14 / ANSWER SPACE FOR QUESTION 14

[2 marks]

[2 marks]

(ii) Persamaan garis lurus yang melalui titik $P(2, 3)$ dan selari dengan garis $2x + 3y = 6$ adalah $2x + 3y = 10$.

the equation of straight line that passes through point $P(2, 3)$ and parallel to perpendicular bisector of AB is $2x + 3y = 10$.

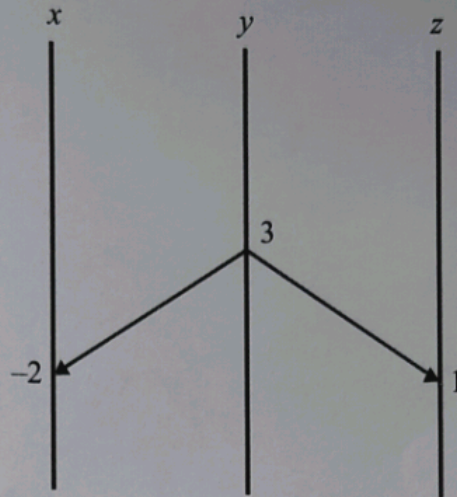
[2 marks]

[2 marks]

Jawapan : Answer:

- 15 Rajah 11 menunjukkan perwakilan pemetaan y kepada x oleh fungsi $f: y \rightarrow py + q$ dan pemetaan y kepada z oleh fungsi $g: y \rightarrow \frac{5}{3y-q}, y \neq \frac{q}{3}$.

Diagram 11 shows the representation of the mapping of y onto x by the function $f: y \rightarrow py + q$ and the mapping of y onto z by the function $g: y \rightarrow \frac{5}{3y-q}, y \neq \frac{q}{3}$.



Rajah 11
Diagram 11

Cari / Find

- (a) nilai p dan nilai q .
the value of p and q .

[4 markah]

[4 marks]

- (b) fungsi yang memetakan x kepada y .
the function that maps x onto y .

[2 markah]

[2 marks]

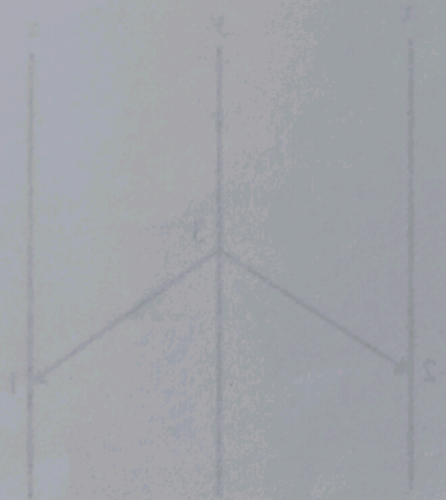
- (c) fungsi yang memetakan x kepada z .
the function that maps x onto z .

[2 markah]

[2 marks]

Jawapan / Answer:

RUANGAN JAWAPAN SOALAN 15 / ANSWER SPACE FOR QUESTION 15



SOALAN MODUL TAMAT
END OF MODULE QUESTION