

SULIT

NO. KAD PENGENALAN

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ANGKA GILIRAN

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**LEMBAGA PEPERIKSAAN
KEMENTERIAN PENDIDIKAN MALAYSIA**

SIJIL PELAJARAN MALAYSIA 2014

3472/1

ADDITIONAL MATHEMATICS

Kertas 1

Nov./Dis.

2 jam

Dua jam

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Tulis nombor kad pengenalan dan angka giliran anda pada petak yang disediakan.*
2. *Kertas soalan ini adalah dalam dwibahasa.*
3. *Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.*
4. *Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Inggeris atau bahasa Melayu.*
5. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

Untuk Kegunaan Pemeriksa		
Kod Pemeriksa:		
Soalan	Markah Penuh	Markah Diperoleh
1	2	
2	2	
3	2	
4	3	
5	4	
6	2	
7	3	
8	3	
9	3	
10	4	
11	3	
12	3	
13	2	
14	4	
15	3	
16	3	
17	4	
18	4	
19	4	
20	4	
21	4	
22	3	
23	4	
24	3	
25	4	
Jumlah	80	

Kertas soalan ini mengandungi 28 halaman bercetak.

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SULIT

The following formulae may be helpful in answering the questions. The symbols given are the ones commonly used.

Rumus-rumus berikut boleh membantu anda menjawab soalan. Simbol-simbol yang diberi adalah yang biasa digunakan.

ALGEBRA

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

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

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

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

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

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

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

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

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

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

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

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

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

CALCULUS KALKULUS

$$1 \quad y = uv, \quad \frac{dy}{dx} = u \frac{dv}{dx} + v \frac{du}{dx}$$

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

$$3 \quad \frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$$

4 Area under a curve
Luas di bawah lengkung

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

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

5 Volume of revolution
Isi padu kisanan

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

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

STATISTICS
STATISTIK

$$1 \quad \bar{x} = \frac{\sum x}{N}$$

$$2 \quad \bar{x} = \frac{\sum fx}{\sum f}$$

$$3 \quad \sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{N}} = \sqrt{\frac{\sum x^2}{N} - \bar{x}^2}$$

$$4 \quad \sigma = \sqrt{\frac{\sum f(x - \bar{x})^2}{\sum f}} = \sqrt{\frac{\sum fx^2}{\sum f} - \bar{x}^2}$$

$$5 \quad m = L + \left(\frac{\frac{1}{2}N - F}{f_m} \right) C$$

$$6 \quad I = \frac{Q_1}{Q_0} \times 100$$

$$7 \quad \bar{I} = \frac{\sum W_i I_i}{\sum W_i}$$

$$8 \quad {}^n P_r = \frac{n!}{(n-r)!}$$

$$9 \quad {}^n C_r = \frac{n!}{(n-r)! r!}$$

$$10 \quad P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$11 \quad P(X = r) = {}^n C_r p^r q^{n-r}, \quad p + q = 1$$

$$12 \quad \text{Mean / Min}, \quad \mu = np$$

$$13 \quad \sigma = \sqrt{npq}$$

$$14 \quad Z = \frac{X - \mu}{\sigma}$$

GEOMETRY
GEOMETRI

$$1 \quad \text{Distance / Jarak} \\ = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$2 \quad \text{Midpoint / Titik tengah} \\ (x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

3 A point dividing a segment of a line
Titik yang membahagi suatu tembereng garis

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

$$4 \quad \text{Area of triangle / Luas segi tiga} \\ = \frac{1}{2} | (x_1 y_2 + x_2 y_3 + x_3 y_1) - (x_2 y_1 + x_3 y_2 + x_1 y_3) |$$

$$5 \quad |\underline{r}| = \sqrt{x^2 + y^2}$$

$$6 \quad \hat{\underline{r}} = \frac{x\underline{i} + y\underline{j}}{\sqrt{x^2 + y^2}}$$

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SULIT

TRIGONOMETRY
TRIGONOMETRI

- | | |
|---|--|
| <p>1 Arc length, $s = r\theta$
<i>Panjang lengkok, $s = j\theta$</i></p> | <p>8 $\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$
$\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$</p> |
| <p>2 Area of sector, $A = \frac{1}{2}r^2\theta$

<i>Luas sektor, $L = \frac{1}{2}j^2\theta$</i></p> | <p>9 $\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$
$\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$</p> |
| <p>3 $\sin^2 A + \cos^2 A = 1$
$\sin^2 A + \cos^2 A = 1$</p> | <p>10 $\tan(A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$</p> |
| <p>4 $\sec^2 A = 1 + \tan^2 A$
$\sec^2 A = 1 + \tan^2 A$</p> | <p>11 $\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$</p> |
| <p>5 $\operatorname{cosec}^2 A = 1 + \cot^2 A$
$\operatorname{kosek}^2 A = 1 + \cot^2 A$</p> | <p>12 $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$</p> |
| <p>6 $\sin 2A = 2 \sin A \cos A$
$\sin 2A = 2 \sin A \cos A$</p> | <p>13 $a^2 = b^2 + c^2 - 2bc \cos A$
$a^2 = b^2 + c^2 - 2bc \cos A$</p> |
| <p>7 $\cos 2A = \cos^2 A - \sin^2 A$
$= 2 \cos^2 A - 1$
$= 1 - 2 \sin^2 A$

$\cos 2A = \cos^2 A - \sin^2 A$
$= 2 \cos^2 A - 1$
$= 1 - 2 \sin^2 A$</p> | <p>14 Area of triangle / <i>Luas segi tiga</i>
$= \frac{1}{2} ab \sin C$</p> |

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

- 1 Diagram 1 shows the relation between Set A and Set B in the arrow diagram form.
Rajah 1 menunjukkan hubungan antara Set A dan Set B dalam bentuk rajah anak panah.

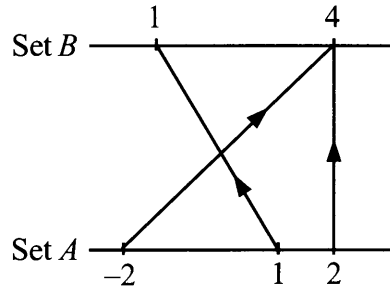


Diagram 1
Rajah 1

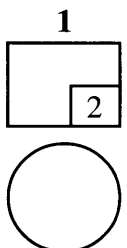
- (a) Represent the relation in the form of ordered pairs.
Wakilkan hubungan itu dalam bentuk pasangan tertib.
- (b) State the domain of the relation.
Nyatakan domain hubungan itu.

[2 marks]
[2 markah]

Answer / Jawapan:

(a)

(b)



2 Diagram 2 shows the function $f: x \rightarrow x - 2m$, where m is a constant.

Rajah 2 menunjukkan suatu fungsi $f: x \rightarrow x - 2m$, dengan keadaan m ialah pemalar.

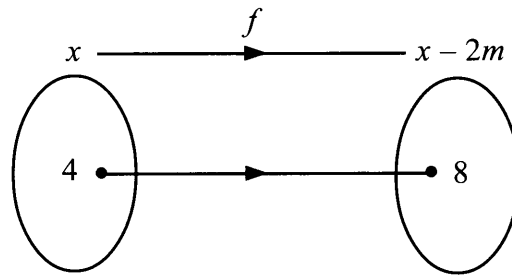


Diagram 2
Rajah 2

Find the value of m .

[2 marks]

Cari nilai m .

[2 markah]

Answer / Jawapan:

2

2

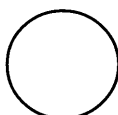
3 Given the quadratic equation $(1 - a)x^2 - 2x + 5 = 0$ has no roots, find the range of values of a . [2 marks]

Diberi persamaan kuadratik $(1 - a)x^2 - 2x + 5 = 0$ tidak mempunyai punca, cari julat nilai a . [2 markah]

Answer / Jawapan:

3

3



- 4 Diagram 4 shows the graph of the quadratic function $f(x) = (x - 3)^2 - 25$.
Rajah 4 menunjukkan graf fungsi kuadratik $f(x) = (x - 3)^2 - 25$.

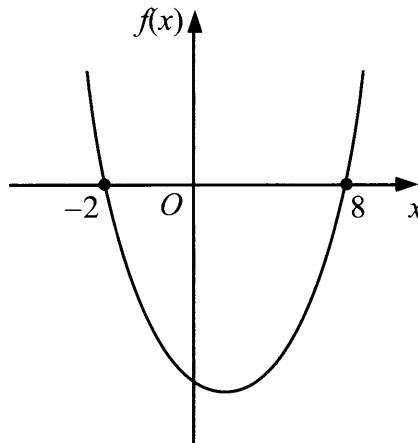


Diagram 4
Rajah 4

State

Nyatakan

- (a) the coordinates of the minimum point of the curve,
koordinat titik minimum bagi lengkung itu,
- (b) the equation of the axis of symmetry of the curve,
persamaan paksi simetri bagi lengkung itu,
- (c) the range of values of x when $f(x)$ is negative.
julat nilai x apabila $f(x)$ ialah negatif.

[3 marks]

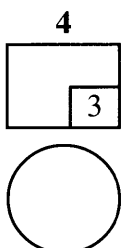
[3 markah]

Answer / Jawapan:

(a)

(b)

(c)



- 5 Given the quadratic equation $2x^2 + mx - 5 = 0$, where m is a constant, find the value of m if

Diberi persamaan kuadratik $2x^2 + mx - 5 = 0$, dengan keadaan m ialah pemalar, cari nilai m jika

- (a) one of the roots of the equation is 2,
satu daripada punca-punca persamaan itu ialah 2,
- (b) the sum of roots of the equation is -4 .
hasil tambah punca-punca persamaan itu ialah -4 .

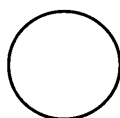
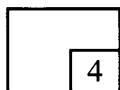
[4 marks]
[4 markah]

Answer / Jawapan:

(a)

(b)

5



6 Simplify:

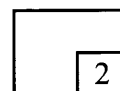
Ringkaskan:

$$\frac{(6x^4y^3)^2}{9x^5y}$$

[2 marks]
[2 markah]

Answer / Jawapan:

6

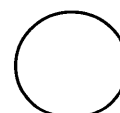
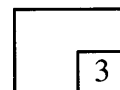
7 Given $\log_k 9 = 2$, find the value ofDiberi $\log_k 9 = 2$, cari nilai(a) k ,(b) $\log_9\left(\frac{1}{k}\right)$.[3 marks]
[3 markah]

Answer / Jawapan:

(a)

(b)

7

[Lihat halaman sebelah
SULIT]

8 It is given the sum of the first n terms of a geometric progression is $S_n = \frac{5}{2}[3^n - 1]$.

Diberi hasil tambah n sebutan pertama bagi suatu jajang geometri ialah

$$S_n = \frac{5}{2}[3^n - 1].$$

Find

Cari

- (a) the first term of the progression,
sebutan pertama jajang itu,
- (b) the common ratio of the progression.
nisbah sepunya jajang itu.

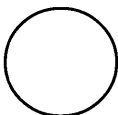
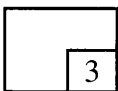
[3 marks]
[3 markah]

Answer / Jawapan:

(a)

(b)

8



- 9 Diagram 9 shows a circle with centre O which is divided into eight sectors.
Rajah 9 menunjukkan sebuah bulatan dengan pusat O dibahagi kepada lapan sektor.

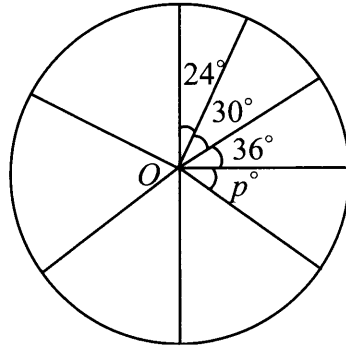


Diagram 9
Rajah 9

The angles of the sectors form a progression with the first term of 24° .
Sudut sektor-sektor itu membentuk suatu janjang dengan sebutan pertama 24° .

State

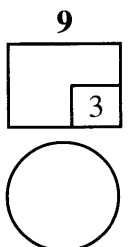
Nyatakan

- (a) whether the progression is an arithmetic progression or a geometric progression,
sama ada janjang itu ialah suatu janjang aritmetik atau janjang geometri,
- (b) the value of p ,
nilai p ,
- (c) the sum of all terms in the progression.
hasil tambah semua sebutan dalam janjang itu.

[3 marks]
[3 markah]

Answer / Jawapan:

- (a)
- (b)
- (c)



- 10 Adam has just completed his diploma in engineering field. He was offered a job from two different companies. Syarikat Satria offered him an initial salary of RM36000 per annum with 5% yearly increment from the basic salary. Syarikat Perdana offered an initial salary of RM30000 per annum with 9% yearly increment from the basic salary. Adam decided to choose the company which offered higher income and save 20% of his salary for further study after working for 10 years.

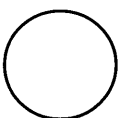
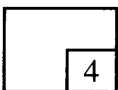
Which company should Adam choose and how much his total saving for his studies?
[Round off your answer to the nearest RM] [4 marks]

Adam baru sahaja menamatkan pengajian diploma dalam bidang kejuruteraan. Dia ditawarkan kerja oleh dua buah syarikat berbeza. Syarikat Satria menawarkan gaji permulaan RM36000 setahun dengan kenaikan tahunan sebanyak 5% daripada gaji pokok. Syarikat Perdana menawarkan gaji permulaan RM30000 setahun dengan kenaikan tahunan 9% daripada gaji pokok. Adam bercadang untuk memilih syarikat yang menawarkan jumlah pendapatan yang paling tinggi dan menabung sebanyak 20% daripada gajinya bagi melanjutkan pelajaran selepas bekerja selama 10 tahun.

Syarikat manakah yang patut Adam pilih dan berapakah jumlah tabungannya untuk melanjutkan pelajaran?
[Bundarkan jawapan anda kepada RM terhampir] [4 markah]

Answer / Jawapan:

10



- 11 The variables x and y are related by the equation $xy = 4x - 2x^3$. Diagram 11 shows the straight line PQ obtained by plotting y against x^2 .

Pembolehubah x dan y dihubungkan oleh persamaan $xy = 4x - 2x^3$. Rajah 11 menunjukkan garis lurus PQ yang diperolehi dengan memplot y melawan x^2 .

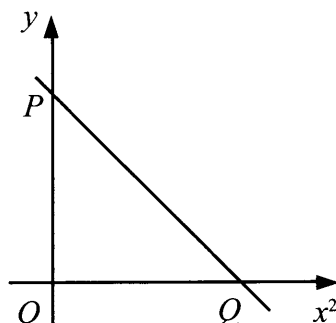


Diagram 11
Rajah 11

- (a) Express the equation $xy = 4x - 2x^3$ in its linear form used to obtain the straight line graph shown in Diagram 11.

Ungkapkan persamaan $xy = 4x - 2x^3$ dalam bentuk linear yang digunakan untuk memperoleh graf garis lurus seperti ditunjukkan dalam Rajah 11.

- (b) State

Nyatakan

- (i) the gradient of the straight line PQ ,
kecerunan bagi garis lurus PQ ,
- (ii) the coordinates of P .
koordinat P .

[3 marks]
[3 markah]

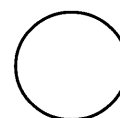
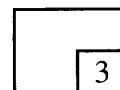
Answer/ Jawapan:

(a)

(b) (i)

(ii)

11



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SULIT]

- 12 Diagram 12 shows the straight line PQ with equation $\frac{x}{5} + \frac{y}{7} = 1$ intersects the straight line AB at point P .

Rajah 12 menunjukkan garis lurus PQ dengan persamaan $\frac{x}{5} + \frac{y}{7} = 1$ bersilang dengan garis lurus AB pada titik P .

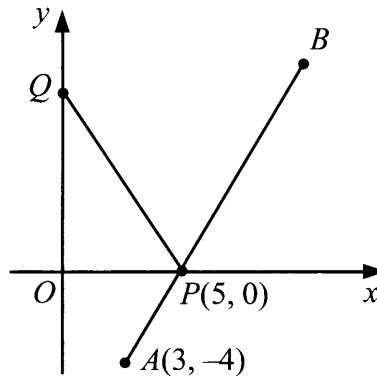


Diagram 12
Rajah 12

- (a) State the y -intercept of PQ .
Nyatakan pintasan- y bagi PQ .
- (b) Find the coordinates of B if $BP = 2PA$.
Cari koordinat B jika $BP = 2PA$.

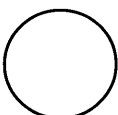
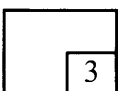
[3 marks]
[3 markah]

Answer / Jawapan:

(a)

(b)

12



- 13 The straight line $y = -3x + 8$ is parallel to the straight line $y = (k + 2)x + 7$, where k is a constant.

Determine the value of k . [2 marks]

Garis lurus $y = -3x + 8$ adalah selari dengan garis lurus $y = (k + 2)x + 7$, dengan keadaan k ialah pemalar.

Tentukan nilai k . [2 markah]

Answer / Jawapan:

13

2

- 14 Solve the equation $\sin 2x + \cos x = 0$ for $0^\circ \leq x \leq 360^\circ$. [4 marks]

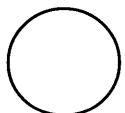
Selesaikan persamaan $\sin 2x + \cos x = 0$ bagi $0^\circ \leq x \leq 360^\circ$. [4 markah]

Answer / Jawapan:

14

4

[Lihat halaman sebelah
SULIT



15 Diagram 15 shows a trapezium $PQRS$ with $QR = 2PS$.

Rajah 15 menunjukkan sebuah trapezium $PQRS$ dengan $QR = 2PS$.

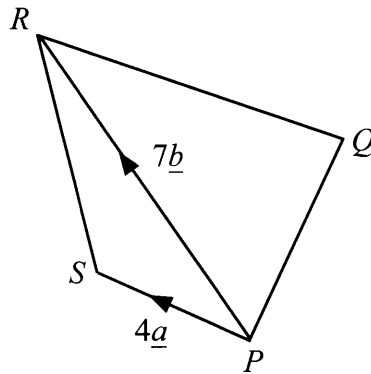


Diagram 15
Rajah 15

Express in terms of \underline{a} and/or \underline{b}

Ungkapkan dalam sebutan \underline{a} dan/atau \underline{b}

(a) $\overrightarrow{SR} - \overrightarrow{PR}$,

(b) \overrightarrow{QP} .

[3 marks]

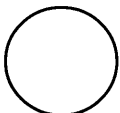
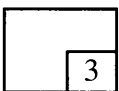
[3 markah]

Answer / Jawapan:

(a)

(b)

15



16 Given $\underline{p} = \begin{pmatrix} -4 \\ 3 \end{pmatrix}$ and $\underline{q} = \begin{pmatrix} 2 \\ k \end{pmatrix}$, find

Diberi $\underline{p} = \begin{pmatrix} -4 \\ 3 \end{pmatrix}$ dan $\underline{q} = \begin{pmatrix} 2 \\ k \end{pmatrix}$, cari

(a) $|\underline{p}|$,

(b) the value of k such that $\underline{p} + \underline{q}$ is parallel to the x -axis.
nilai k dengan keadaan $\underline{p} + \underline{q}$ adalah selari dengan paksi- x .

[3 marks]

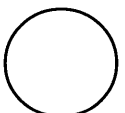
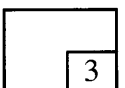
[3 markah]

Answer/ Jawapan:

(a)

(b)

16



- 17 Due to the high living cost, Siva has planted several types of vegetables for his own consumption on a rectangular shape empty plot of land behind his house. He plans to fence the land which has a dimension of $6x$ m and $(4 - x)$ m.

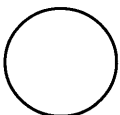
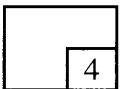
Find the length, in m, the fence he has to buy when the area of the land is maximum.
[4 marks]

Akibat daripada peningkatan kos sara hidup, Siva telah menanam beberapa jenis sayur untuk kegunaan sendiri di kawasan lapang berbentuk segi empat tepat di belakang rumahnya. Dia bercadang untuk memagar kawasan tersebut yang berukuran $6x$ m dan $(4 - x)$ m.

Cari panjang, dalam m, pagar yang perlu dia beli apabila luas kawasan itu adalah maksimum.
[4 markah]

Answer / Jawapan:

17



18 Given $x = t^2 + 3$ and $\frac{dy}{dt} = 14t^3$, find

Diberi $x = t^2 + 3$ dan $\frac{dy}{dt} = 14t^3$, cari

(a) $\frac{dx}{dt}$,

(b) $\frac{dy}{dx}$, in terms of x .

$\frac{dy}{dx}$, dalam sebutan x .

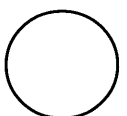
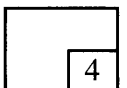
[4 marks]
[4 markah]

Answer / Jawapan:

(a)

(b)

18



19 Given $\int_1^3 f(x)dx = 4$, find

Diberi $\int_1^3 f(x)dx = 4$, cari

(a) $\int_3^1 2f(x)dx$,

(b) $\int_1^3 [1 + f(x)]dx$.

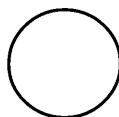
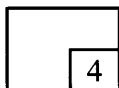
[4 marks]
[4 markah]

Answer / Jawapan:

(a)

(b)

19



- 20 Diagram 20 shows part of the front view of a square shape mural art on a wall in a school building. PT is an arc of a circle with a centre Q and QT is an arc of a circle with a centre P .

Rajah 20 menunjukkan pandangan hadapan sebahagian lukisan mural berbentuk segi empat sama pada dinding bangunan sekolah. PT adalah lengkok bulatan dengan pusat Q dan QT adalah lengkok bulatan dengan pusat P .

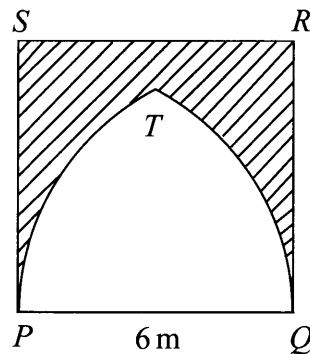


Diagram 20
Rajah 20

The shaded region shows the part that needs to be repainted. Cheng and his friends decided to paint the area with red colour.

Calculate the area, in m^2 , of that region.

Kawasan berlorek menunjukkan bahagian yang perlu dicat semula. Cheng bersama rakannya bercadang untuk mengecat kawasan itu dengan warna merah.

Kira luas, dalam m^2 , kawasan itu.

[4 marks]

[4 markah]

Answer / Jawapan:

21 A set of data consists of 9, 2, 7, $x^2 - 1$ and 4. Given the mean is 6, find
Satu set data terdiri daripada 9, 2, 7, $x^2 - 1$ dan 4. Diberi min ialah 6, cari

- (a) the positive value of x ,
nilai positif bagi x ,
- (b) the median using the value of x in **21(a)**.
*median menggunakan nilai x di **21(a)**.*

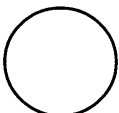
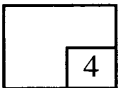
[4 marks]
[4 markah]

Answer / Jawapan:

(a)

(b)

21



- 22 Diagram 22 shows a histogram for the distribution of scores obtained by a group of participants in a quiz.

Rajah 22 menunjukkan satu histogram bagi taburan skor yang diperoleh sekumpulan peserta dalam satu kuiz.

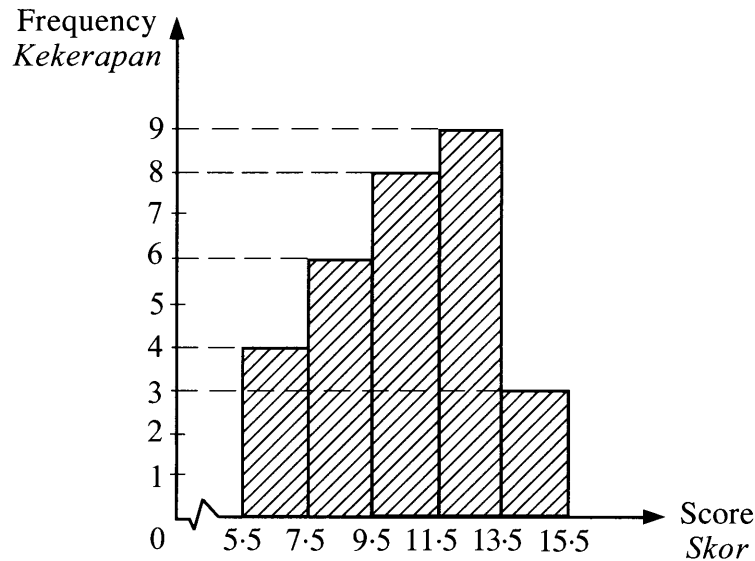


Diagram 22
Rajah 22

Find

Cari

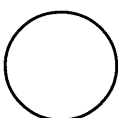
- (a) the total number of participants,
jumlah bilangan peserta,
- (b) the mean score.
skor min.

[3 marks]
[3 markah]

Answer / *Jawapan:*

(a)

(b)



- 23 A group of 5 students are to be chosen from 9 boys and 7 girls to form a school debate team.

Find the number of different ways to form the team which consists of

Satu kumpulan 5 orang murid hendak dipilih daripada 9 orang murid lelaki dan 7 orang murid perempuan untuk membentuk satu pasukan debat sekolah.

Cari bilangan cara berbeza untuk membentuk pasukan itu yang mengandungi

- (a) girls only,
murid perempuan sahaja,
- (b) at least 4 boys.
sekurang-kurangnya 4 orang murid lelaki.

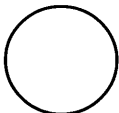
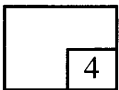
[4 marks]
[4 markah]

Answer / Jawapan:

(a)

(b)

23



24 The events A and B are not independent.

Peristiwa A dan B adalah bersandar.

Given $P(A) = \frac{3}{5}$, $P(B) = \frac{1}{4}$ and $P(A \cup B) = \frac{1}{5}$, find

Diberi $P(A) = \frac{3}{5}$, $P(B) = \frac{1}{4}$ dan $P(A \cup B) = \frac{1}{5}$, cari

(a) $P[(A \cup B)']$,

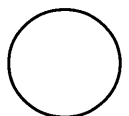
(b) $P(A \cap B)$.

[3 marks]
[3 markah]

Answer / Jawapan:

(a)

(b)



25 Diagram 25 shows the standard normal distribution graph with mean, μ and standard deviation, σ .

Rajah 25 menunjukkan graf taburan normal piawai dengan min, μ dan sisihan piawai, σ .

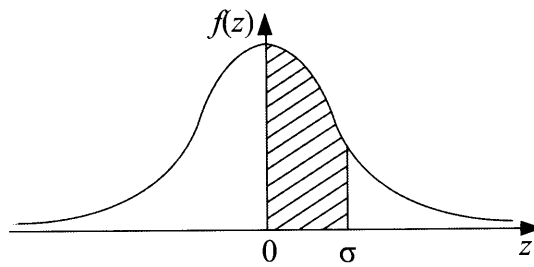


Diagram 25
Rajah 25

(a) State

Nyatakan

- (i) the value of μ ,
nilai μ ,
- (ii) the value of σ .
nilai σ .

(b) Find the area of the shaded region.

Cari luas rantau berlorek.

[4 marks]
[4 markah]

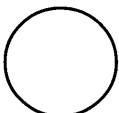
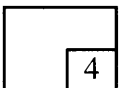
Answer / *Jawapan:*

(a) (i)

(ii)

(b)

25



END OF QUESTION PAPER
KERTAS SOALAN TAMAT

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

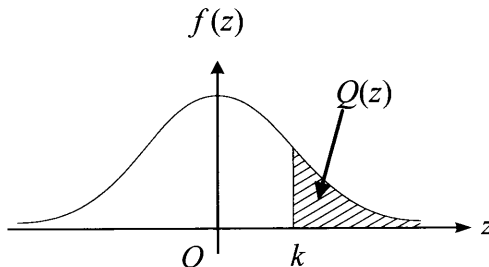
z										Minus / Tolak										
	0	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	
0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641	4	8	12	16	20	24	28	32	36	
0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247	4	8	12	16	20	24	28	32	36	
0.2	0.4207	0.4168	0.4129	0.4090	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		0.00990	0.00964	0.00939	0.00914			0	1	1	1	1	2	2	2	2	
									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

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

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

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of **25** questions.
Kertas soalan ini mengandungi 25 soalan.
2. Answer **all** questions.
Jawab semua soalan.
3. Write your answers in the spaces provided in the question paper.
Tulis jawapan anda dalam ruang yang disediakan dalam kertas soalan.
4. Show your working. It may help you to get marks.
Tunjukkan langkah-langkah penting dalam kerja mengira anda. Ini boleh membantu anda untuk mendapatkan markah.
5. If you wish to change your answer, cross out the answer that you have done. Then write down the new answer.
Sekiranya anda hendak menukar jawapan, batalkan jawapan yang telah dibuat. Kemudian tulis jawapan yang baharu.
6. The diagrams in the questions provided are not drawn to scale unless stated.
Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
7. The marks allocated for each question are shown in brackets.
Markah yang diperuntukkan bagi setiap soalan ditunjukkan dalam kurungan.
8. A list of formulae is provided on pages **2** to **4**.
Satu senarai rumus disediakan di halaman 2 hingga 4.
9. The Upper Tail Probability $Q(z)$ For The Normal Distribution $N(0, 1)$ Table is provided on page **27**.
Jadual Kebarangkalian Hujung Atas $Q(z)$ Bagi Taburan Normal $N(0, 1)$ disediakan di halaman 27.
10. You may use a scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik.
11. Hand in this question paper to the invigilator at the end of the examination.
Serahkan kertas soalan ini kepada pengawas peperiksaan di akhir peperiksaan.