SULIT

NO. KAD PENGENALAN

ANGKA GILIRAN

LEMBAGA PEPERIKSAAN
KEMENTERIAN PENDIDIKAN MALAYSIA

SIJIL PELAJARAN MALAYSIA 2018

ADDITIONAL MATHEMATICS 3472/1

Kertas 1
Nov./Dis.

2 jam **Dua jam**

JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

1. *Tulis* **nombor kad pengenalan** *dan* **angka giliran** *anda pada petak yang disediakan.*

2. *Kertas peperiksaan 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 peperiksaan ini.*

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

Kertas peperiksaan ini mengandungi 36 halaman bercetak.

[*Lihat halaman sebelah*

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 $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

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 $\log_a \dfrac{m}{n} = \log_a m - \log_a n$

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

8 $\log_a b = \dfrac{\log_c b}{\log_c a}$

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

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

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

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

13 $S_\infty = \dfrac{a}{1 - r}, \; |r| < 1$

CALCULUS
KALKULUS

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

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

3 $\dfrac{dy}{dx} = \dfrac{dy}{du} \times \dfrac{du}{dx}$

4 Area under a curve
Luas di bawah lengkung

$= \int_a^b y \, dx$ or (*atau*)

$= \int_a^b x \, dy$

5 Volume of revolution
Isi padu kisaran

$= \int_a^b \pi y^2 \, dx$ or (*atau*)

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

STATISTICS
STATISTIK

1 $\bar{x} = \dfrac{\sum x}{N}$

2 $\bar{x} = \dfrac{\sum fx}{\sum f}$

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

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

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

6 $I = \dfrac{Q_1}{Q_0} \times 100$

7 $\bar{I} = \dfrac{\sum W_i I_i}{\sum W_i}$

8 ${}^nP_r = \dfrac{n!}{(n-r)!}$

9 ${}^nC_r = \dfrac{n!}{(n-r)!r!}$

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

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

12 Mean / *Min* , $\mu = np$

13 $\sigma = \sqrt{npq}$

14 $Z = \dfrac{X - \mu}{\sigma}$

GEOMETRY
GEOMETRI

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

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

3 A point dividing a segment of a line
Titik yang membahagi suatu tembereng garis
$(x, y) = \left(\dfrac{nx_1 + mx_2}{m+n}, \dfrac{ny_1 + my_2}{m+n}\right)$

4 Area of triangle / *Luas segi tiga*
$= \dfrac{1}{2}\left|(x_1y_2 + x_2y_3 + x_3y_1) - (x_2y_1 + x_3y_2 + x_1y_3)\right|$

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

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

TRIGONOMETRY
TRIGONOMETRI

1 Arc length, $s = r\theta$
Panjang lengkok, $s = j\theta$

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

Luas sektor, $L = \frac{1}{2}j^2\theta$

3 $\sin^2 A + \cos^2 A = 1$
$\sin^2 A + \text{kos}^2 A = 1$

4 $\sec^2 A = 1 + \tan^2 A$
$\text{sek}^2 A = 1 + \tan^2 A$

5 $\text{cosec}^2 A = 1 + \cot^2 A$
$\text{kosek}^2 A = 1 + \text{kot}^2 A$

6 $\sin 2A = 2 \sin A \cos A$
$\sin 2A = 2 \sin A \text{ kos } A$

7 $\cos 2A = \cos^2 A - \sin^2 A$
$= 2\cos^2 A - 1$
$= 1 - 2\sin^2 A$

$\text{kos } 2A = \text{kos}^2 A - \sin^2 A$
$= 2\,\text{kos}^2 A - 1$
$= 1 - 2\sin^2 A$

8 $\tan 2A = \dfrac{2\tan A}{1 - \tan^2 A}$

9 $\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$
$\sin(A \pm B) = \sin A \text{ kos } B \pm \text{kos } A \sin B$

10 $\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$
$\text{kos}(A \pm B) = \text{kos } A \text{ kos } B \mp \sin A \sin B$

11 $\tan(A \pm B) = \dfrac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$

12 $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

13 $a^2 = b^2 + c^2 - 2bc\cos A$
$a^2 = b^2 + c^2 - 2bc \text{ kos } A$

14 Area of triangle / *Luas segi tiga*
$= \frac{1}{2}ab \sin C$

For Examiner's Use

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

1 Diagram 1 shows a probability distribution graph for a random variable $X, X \sim N(\mu, \sigma^2)$.
Rajah 1 *menunjukkan graf taburan kebarangkalian bagi suatu pemboleh ubah rawak* $X, X \sim N(\mu, \sigma^2)$.

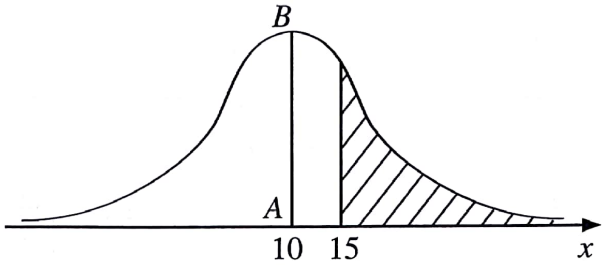

Diagram 1
Rajah 1

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

(*a*) State the value of μ.
Nyatakan nilai μ.

(*b*) If the area of the shaded region is 0·38, state the value of $P(5 \leq X \leq 15)$.
Jika luas kawasan berlorek ialah 0·38, *nyatakan nilai bagi* $P(5 \leq X \leq 15)$.

[2 *marks*]
[2 *markah*]

Answer / *Jawapan*:

(*a*)

(*b*)

1

2

2 (*a*) Given ${}^{6}C_{n} > 1$, list out all the possible values of *n*. [1 *mark*]

Diberi ${}^{6}C_{n} > 1$, *senaraikan semua nilai-nilai yang mungkin bagi n.* [1 *markah*]

(*b*) Given ${}^{y}C_{m} = {}^{y}C_{n}$, express *y* in terms of *m* and *n*. [1 *mark*]

Diberi ${}^{y}C_{m} = {}^{y}C_{n}$, *ungkapkan y dalam sebutan m dan n.* [1 *markah*]

Answer / *Jawapan*:

(*a*)

(*b*)

2

2

For Examiner's Use

3 Table 1 shows the information about a set of data.
Jadual 1 menunjukkan maklumat tentang suatu set data.

Set	Data	Standard deviation *Sisihan piawai*	Median
Original *Asal*	$x_1, x_2, x_3, \ldots$	5	2
New *Baharu*	$px_1 + 1,\ px_2 + 1,\ px_3 + 1, \ldots$	m	q

Table 1
Jadual 1

State
Nyatakan

(*a*) the value of p if $m = 20$,
nilai p jika $m = 20$,

(*b*) the value of q if $p = 2{\cdot}5$.
nilai q jika $p = 2{\cdot}5$.

[2 *marks*]
[2 *markah*]

Answer / *Jawapan*:

3

2

4 Table 2 shows the distribution of scores obtained by a group of students in a competition.
Jadual 2 menunjukkan taburan skor yang diperoleh sekumpulan murid dalam suatu pertandingan.

Score ***Skor***	1	2	3	4	5
Frequency ***Kekerapan***	3	6	7	x	1

Table 2
Jadual 2

(*a*) State the minimum value of x if the mode score is 4.
Nyatakan nilai minimum bagi x jika skor mod ialah 4.

(*b*) Find the mean score of the distribution if $x = 1$.
Cari min skor bagi taburan itu jika $x = 1$.

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

(*a*)

(*b*)

4

3

For Examiner's Use

5 Find the value of

Cari nilai bagi

(*a*) $\lim_{x \to 1}(7 - x^2)$,

$\text{had}\lim_{x \to 1}(7 - x^2)$,

(*b*) $f''(2)$ if $f'(x) = 2x^3 - 4x + 3$.

$f''(2)$ *jika* $f'(x) = 2x^3 - 4x + 3$.

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

(*a*)

(*b*)

5

3

6 It is given that $L = 4t - t^2$ and $x = 3 + 6t$.

Diberi bahawa $L = 4t - t^2$ *dan* $x = 3 + 6t$.

(*a*) Express $\frac{dL}{dx}$ in terms of t.

Ungkapkan $\frac{dL}{dx}$ *dalam sebutan t.*

(*b*) Find the small change in x, when L changes from 3 to 3·4 at the instant $t = 1$.

Cari perubahan kecil bagi x, apabila L berubah daripada 3 *kepada* 3·4 *pada ketika* $t = 1$.

[4 *marks*]
[4 *markah*]

Answer / *Jawapan*:

(*a*)

(*b*)

6

4

For Examiner's Use

7 Diagram 2 shows the curve $y = g(x)$. The straight line is a tangent to the curve.

Rajah 2 menunjukkan lengkung $y = g(x)$. *Garis lurus ialah tangen kepada lengkung itu.*

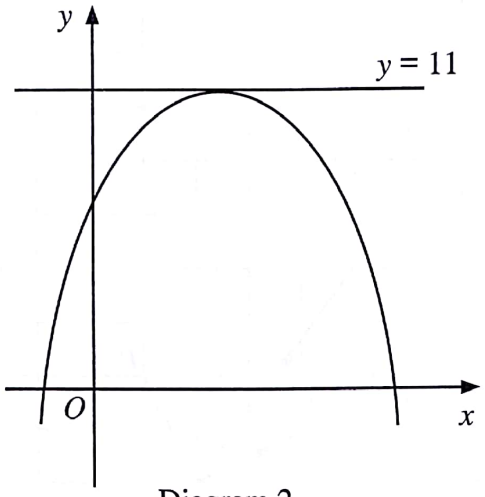

Diagram 2
Rajah 2

Given $g'(x) = -4x + 8$, find the equation of the curve.

Diberi $g'(x) = -4x + 8$, *cari persamaan lengkung itu.*

[4 *marks*]
[4 *markah*]

Answer / *Jawapan*:

7

4

8 Diagram 3 shows the vectors $\overrightarrow{OP}$, $\overrightarrow{OQ}$ and $\overrightarrow{OM}$ drawn on a square grid.

Rajah 3 menunjukkan vektor-vektor $\overrightarrow{OP}$, $\overrightarrow{OQ}$ *dan* $\overrightarrow{OM}$ *dilukis pada grid segi empat sama.*

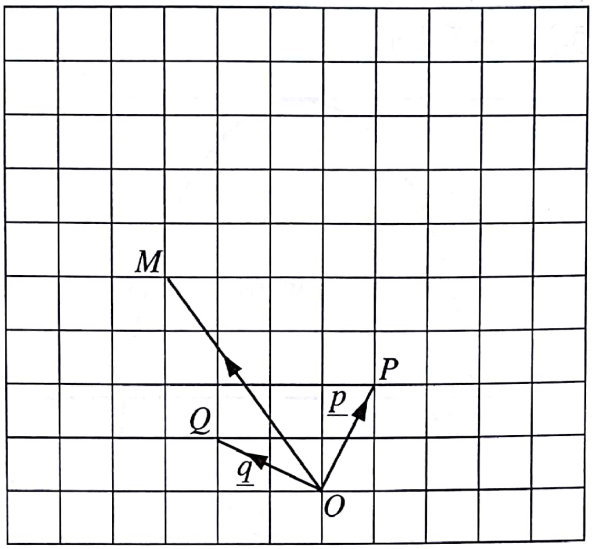

Diagram 3
Rajah 3

(*a*) Express $\overrightarrow{OM}$ in the form $h\underline{p} + k\underline{q}$, where h and k are constants.

Ungkapkan $\overrightarrow{OM}$ *dalam bentuk* $h\underline{p} + k\underline{q}$, *dengan keadaan* h *dan* k *ialah pemalar.*

(*b*) On the Diagram 3, mark and label the point N such that $\overrightarrow{MN} + \overrightarrow{OQ} = 2\overrightarrow{OP}$.

Pada Rajah 3, tanda dan label titik N dengan keadaan $\overrightarrow{MN} + \overrightarrow{OQ} = 2\overrightarrow{OP}$.

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

(*a*)

8

3

For Examiner's Use

9 $A(2, 3)$ and $B(-2, 5)$ lie on a Cartesian plane.
It is given that $3\overrightarrow{OA} = 2\overrightarrow{OB} + \overrightarrow{OC}$.

$A(2, 3)$ *dan* $B(-2, 5)$ *terletak pada suatu satah Cartes.*
Diberi bahawa $3\overrightarrow{OA} = 2\overrightarrow{OB} + \overrightarrow{OC}$.

Find
Cari

(*a*) the coordinates of C,
koordinat C,

(*b*) $|\overrightarrow{AC}|$.

[4 *marks*]
[4 *markah*]

Answer / *Jawapan*:

(*a*)

(*b*)

10 The following information refers to the equation of two straight lines, *AB* and *CD*.

Maklumat berikut adalah merujuk kepada persamaan dua garis lurus, AB dan CD.

$$AB : y - 2kx - 3 = 0$$

$$CD : \frac{x}{3h} + \frac{y}{4} = 1$$

where h and k are constants.

dengan keadaan h dan k ialah pemalar.

Given the straight lines *AB* and *CD* are perpendicular to each other, express h in terms of k.

Diberi garis lurus AB dan garis lurus CD adalah berserenjang antara satu sama lain, ungkapkan h dalam sebutan k.

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

10

3

For Examiner's Use

11 (*a*) Given $\cos\theta = h$, state $\cos(180^\circ - \theta)$ in terms of h. [1 *mark*]
Diberi $\text{kos}\,\theta = h$, *nyatakan* $\text{kos}(180^\circ - \theta)$ *dalam sebutan h.* [1 *markah*]

(*b*) Diagram 4 shows part of the graph $y = \frac{3}{2}\sin 6\alpha$.
Rajah 4 *menunjukkan sebahagian daripada graf* $y = \frac{3}{2}\sin 6\alpha$.

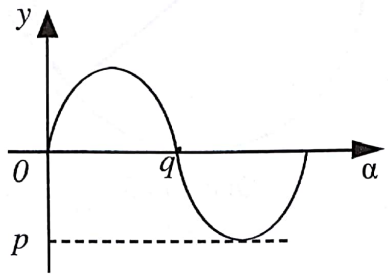

Diagram 4
Rajah 4

State the value of p and of q.
Nyatakan nilai p dan nilai q.

[2 *marks*]
[2 *markah*]

Answer / *Jawapan*:

(*a*)

(*b*)

12 Diagram 5 shows a circle with centre O.

Rajah 5 menunjukkan sebuah bulatan dengan pusat O.

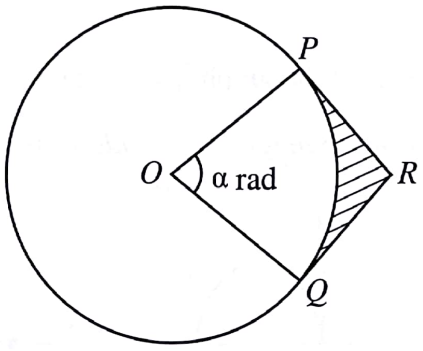

Diagram 5
Rajah 5

PR and QR are tangents to the circle at points P and Q respectively. It is given that the length of minor arc PQ is 4 cm and $OR = \frac{5}{\alpha}$ cm.

PR dan QR masing-masing adalah tangen kepada bulatan itu pada titik P dan titik Q. Diberi bahawa panjang lengkok minor PQ ialah 4 cm *dan* $OR = \frac{5}{\alpha}$ cm.

Express in terms of α

Ungkapkan dalam sebutan α

(a) the radius, r, of the circle,
jejari, r, bulatan itu,

(b) the area, A, of the shaded region.
luas, A, kawasan berlorek.

[4 *marks*]
[4 *markah*]

For Examiner's Use

Answer / *Jawapan*:

(*a*)

(*b*)

12

4

13 Diagram 6 shows the graph of a straight line $\frac{x^2}{y}$ against $\frac{1}{x}$.

Rajah 6 menunjukkan graf garis lurus $\frac{x^2}{y}$ *melawan* $\frac{1}{x}$.

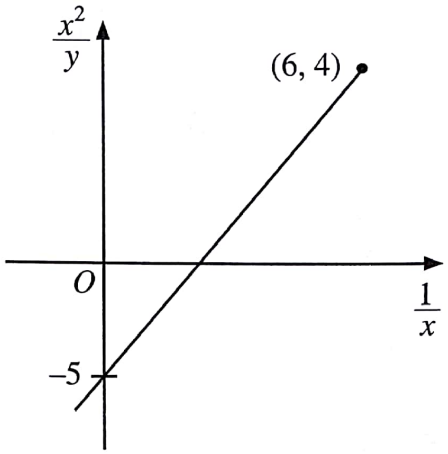

Diagram 6
Rajah 6

Based on Diagram 6, express y in terms of x.
Berdasarkan Rajah 6, ungkapkan y dalam sebutan x.

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

13

3

For Examiner's Use

14 It is given that p, 2 and q are the first three terms of a geometric progression.
Diberi bahawa p, 2 dan q ialah tiga sebutan pertama bagi suatu janjang geometri.

Express in terms of q
Ungkapkan dalam sebutan q

(a) the first term and the common ratio of the progression,
sebutan pertama dan nisbah sepunya janjang itu,

(b) the sum to infinity of the progression.
hasil tambah sebutan hingga ketakterhinggaan janjang itu.

[4 *marks*]
[4 *markah*]

Answer / *Jawapan*:

(a)

(b)

14

4

15 A student has a wire with the length of 13·16 m. The student divided the wire into several pieces. Each piece is to form a square. Diagram 7 shows the first three squares formed by the student.

Seorang murid mempunyai seutas dawai dengan panjang 13·16 m. *Murid itu membahagikan dawai itu kepada beberapa bahagian. Setiap bahagian akan membentuk satu segi empat sama. Rajah 7 menunjukkan tiga buah segi empat sama yang pertama yang dibentuk oleh murid itu.*

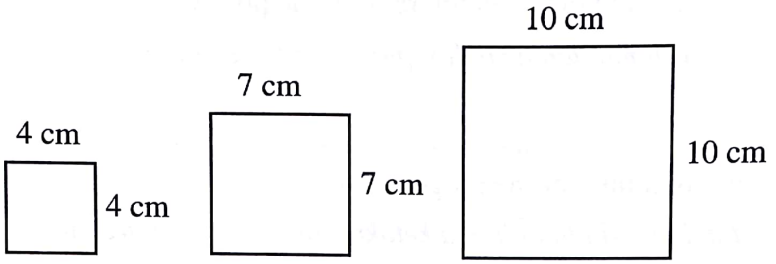

Diagram 7
Rajah 7

How many squares can be formed by the student?

Berapa buah segi empat sama yang boleh dibentuk oleh murid itu?

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

15

3

For Examiner's Use

16 Given $2^p + 2^p = 2^k$, express p in terms of k. [2 *marks*]

Diberi $2^p + 2^p = 2^k$, *ungkapkan p dalam sebutan k.* [2 *markah*]

Answer / *Jawapan*:

16

2

17 (*a*) Given $P = \log_a Q$, state the conditions of *a*. [1 *mark*]

Diberi $P = \log_a Q$, *nyatakan syarat-syarat bagi a.* [1 *markah*]

(*b*) Given $\log_3 y = \frac{2}{\log_{xy} 3}$, express *y* in terms of *x*. [3 *marks*]

Diberi $\log_3 y = \frac{2}{\log_{xy} 3}$, *ungkapkan y dalam sebutan x.* [3 *markah*]

Answer / *Jawapan*:

(*a*)

(*b*)

For Examiner's Use

18 Diagram 8 shows the graph $y=a(x-p)^2+q$, where a, p and q are constants. The straight line $y=-8$ is the tangent to the curve at point H.

Rajah 8 menunjukkan graf $y=a(x-p)^2+q$, *dengan keadaan* a, p *dan* q *ialah pemalar. Garis lurus* $y=-8$ *ialah tangen kepada lengkung pada titik* H.

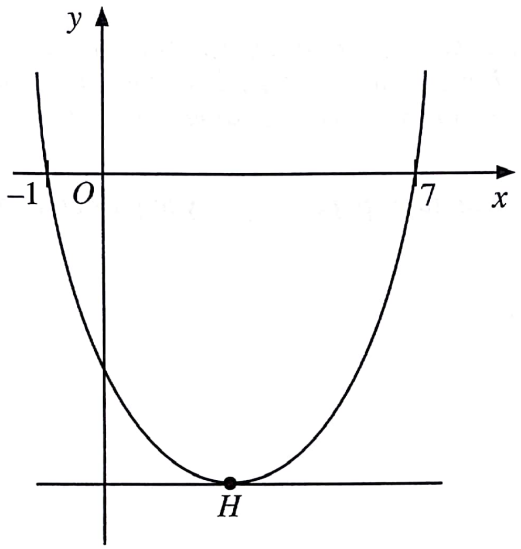

Diagram 8
Rajah 8

(*a*) State the coordinates of H.
Nyatakan koordinat H.

(*b*) Find the value of a.
Cari nilai a.

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

(*a*)

(*b*)

18

3

19 Firdaus has a rectangular plywood with a dimension $3x$ metre in length and $2x$ metre in width. He cuts part of the plywood into a square shape with sides of x metre to make a table surface.

Find the range of values of x if the remaining area of the plywood is at least (x^2+4) metre^2. [3 *marks*]

Firdaus mempunyai sekeping papan lapis berbentuk segi empat tepat yang berukuran $3x$ meter panjang dan $2x$ meter lebar. Dia memotong sebahagian daripada papan lapis itu kepada bentuk segi empat sama yang bersisi x meter untuk membuat permukaan meja.

Cari julat nilai x jika luas papan lapis yang tinggal adalah sekurang-kurangnya (x^2+4) meter^2. [3 *markah*]

Answer / *Jawapan*:

19

3

For Examiner's Use

20 It is given that the curve $y=(p-2)x^2-x+7$, where p is a constant, intersects with the straight line $y=3x+5$ at two points.

Find the range of values of p. [3 *marks*]

Diberi bahawa lengkung $y=(p-2)x^2-x+7$, *dengan keadaan* p *ialah pemalar, bersilang dengan garis lurus* $y=3x+5$ *pada dua titik.*

Cari julat nilai p. [3 *markah*]

Answer / *Jawapan*:

20

3

21 It is given that the quadratic equation $hx^2-3x+k=0$, where h and k are constants, has roots β and 2β.

Express h in terms of k. [3 *marks*]

Diberi bahawa persamaan kuadratik $hx^2-3x+k=0$, *dengan keadaan* h *dan* k *ialah pemalar, mempunyai punca-punca* β *dan* 2β.

Ungkapkan h *dalam sebutan* k. [3 *markah*]

Answer / *Jawapan*:

21

3

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HALAMAN KOSONG

22 Diagram 9 shows the relation between set A, set B and set C.

Rajah 9 menunjukkan hubungan antara set A, set B dan set C.

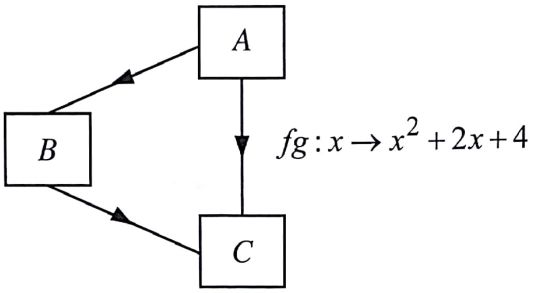


Diagram 9
Rajah 9

It is given that set A maps to set B by the function $\frac{x+1}{2}$ and maps to set C by $fg : x \to x^2 + 2x + 4$.

Diberi bahawa set A dipetakan kepada set B oleh fungsi $\frac{x+1}{2}$ *dan dipetakan kepada set C oleh* $fg : x \to x^2 + 2x + 4$.

(a) Write the function which maps set A to set B by using the function notation.

Tulis fungsi yang memetakan set A kepada set B dengan menggunakan tatatanda fungsi.

(b) Find the function which maps set B to set C.

Cari fungsi yang memetakan set B kepada set C.

[4 *marks*]
[4 *markah*]

For Examiner's Use

Answer / *Jawapan*:

(*a*)

(*b*)

22

4

23 Diagram 10 shows the position of three campsites A, B and C at a part of a riverbank drawn on a Cartesian plane, such that A and B lie on the same straight riverbank.

Rajah 10 *menunjukkan kedudukan tiga tapak perkhemahan A, B dan C di sebahagian tebing sebatang sungai yang dilukis pada suatu satah Cartes, dengan keadaan A dan B terletak pada sebelah tebing sungai yang lurus.*

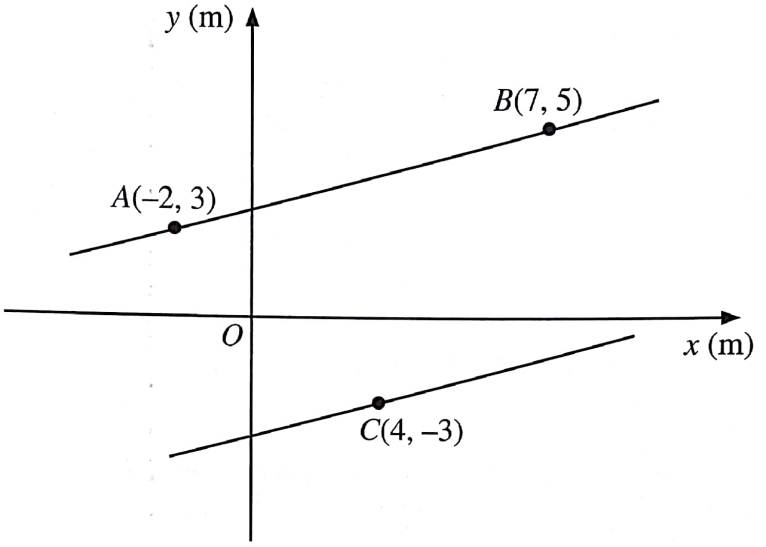


Diagram 10
Rajah 10

Shah wants to cross the river from campsite C to the opposite riverbank where the campsites A and B are located.

Find the shortest distance, in m, that he can take to cross the river. Give your answer correct to four decimal places.

Shah hendak menyeberangi sungai tersebut dari tapak perkhemahan C ke tebing sungai bertentangan di mana terletaknya tapak perkhemahan A dan B.

Cari jarak terdekat, dalam m, *yang dia boleh lalui untuk menyeberangi sungai tersebut. Beri jawapan anda betul kepada empat tempat perpuluhan.*

[4 *marks*]
[4 *markah*]

For Examiner's Use

Answer / *Jawapan*:

23

4

24 A voluntary body organises a first aid course 4 times per month, every Saturday from March until September.
[Assume there are four Saturdays in every month]

Sueraya intends to join the course but she might need to spare a Saturday per month to accompany her mother to the hospital. The probability that Sueraya will attend the course each Saturday is 0·8. Sueraya will be given a certificate of monthly attendance if she can attend the course at least 3 times a month.

Sebuah badan sukarela menganjurkan kursus pertolongan cemas 4 kali sebulan, setiap Sabtu dari Mac hingga September.
[*Andaikan setiap bulan mempunyai empat hari Sabtu*]

Sueraya berhasrat untuk menyertai kursus tersebut tetapi dia mungkin perlu meluangkan satu hari Sabtu setiap bulan untuk menemani ibunya ke hospital. Kebarangkalian bahawa Sueraya akan hadir ke kursus tersebut pada setiap Sabtu ialah 0·8. Sueraya akan diberi sijil kehadiran bulanan jika dia boleh menghadiri kursus tersebut sekurang-kurangnya 3 kali sebulan.

(*a*) Find the probability that Sueraya will be given the certificate of monthly attendance.

Cari kebarangkalian bahawa Sueraya akan diberi sijil kehadiran bulanan.

(*b*) Sueraya will qualify to sit for the first aid test if she obtains more than 5 certificates of monthly attendance.

Find the probability that Sueraya qualifies to take the first aid test.

Sueraya akan layak untuk menduduki ujian pertolongan cemas jika dia memperoleh lebih daripada 5 sijil kehadiran bulanan.

Cari kebarangkalian bahawa Sueraya layak untuk menduduki ujian pertolongan cemas itu.

[4 *marks*]
[4 *markah*]

For Examiner's Use

Answer / *Jawapan*:

(*a*)

(*b*)

24

4

25 Diagram 11 shows seven letter cards.

Rajah 11 *menunjukkan tujuh keping kad huruf.*

M	***I***	***N***	***E***	***R***	***A***	***L***

Diagram 11
Rajah 11

Five cards are chosen at random to form a code.

Find the probability that the code formed, contains at least 3 consonants are arranged side by side. Give your answer in the simplest fraction form.

Lima kad dipilih secara rawak untuk membentuk satu kod.

Cari kebarangkalian bahawa kod yang dibentuk itu, mengandungi sekurang-kurangnya 3 huruf konsonan disusun bersebelahan. Beri jawapan anda dalam bentuk pecahan termudah.

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

25

3

END OF QUESTION PAPER
KERTAS PEPERIKSAAN 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	0	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
											TOLAK								
0.0	.5000	.4960	.4920	.4880	.4840	.4801	.4761	.4721	.4681	.4641	4	8	12	16	20	24	28	32	36
0.1	.4602	.4562	.4522	.4483	.4443	.4404	.4364	.4325	.4286	.4247	4	8	12	16	20	24	28	32	36
0.2	.4207	.4168	.4129	.4090	.4052	.4013	.3974	.3936	.3897	.3859	4	8	12	15	19	23	27	31	35
0.3	.3821	.3783	.3745	.3707	.3669	.3632	.3594	.3557	.3520	.3483	4	7	11	15	19	22	26	30	34
0.4	.3446	.3409	.3372	.3336	.3300	.3264	.3228	.3192	.3156	.3121	4	7	11	14	18	22	25	29	32
0.5	.3085	.3050	.3015	.2981	.2946	.2912	.2877	.2843	.2810	.2776	3	7	10	14	17	20	24	27	31
0.6	.2743	.2709	.2676	.2643	.2611	.2578	.2546	.2514	.2483	.2451	3	7	10	13	16	19	23	26	29
0.7	.2420	.2389	.2358	.2327	.2296	.2266	.2236	.2206	.2177	.2148	3	6	9	12	15	18	21	24	27
0.8	.2119	.2090	.2061	.2033	.2005	.1977	.1949	.1922	.1894	.1867	3	5	8	11	14	16	19	22	25
0.9	.1841	.1814	.1788	.1762	.1736	.1711	.1685	.1660	.1635	.1611	3	5	8	10	13	15	18	20	23
1.0	.1587	.1562	.1539	.1515	.1492	.1469	.1446	.1423	.1401	.1379	2	5	7	9	12	14	16	19	21
1.1	.1357	.1335	.1314	.1292	.1271	.1251	.1230	.1210	.1190	.1170	2	4	6	8	10	12	14	16	18
1.2	.1151	.1131	.1112	.1093	.1075	.1056	.1038	.1020	.1003	.0985	2	4	6	7	9	11	13	15	17
1.3	.0968	.0951	.0934	.0918	.0901	.0885	.0869	.0853	.0838	.0823	2	3	5	6	8	10	11	13	14
1.4	.0808	.0793	.0778	.0764	.0749	.0735	.0721	.0708	.0694	.0681	1	3	4	6	7	8	10	11	13
1.5	.0668	.0655	.0643	.0630	.0618	.0606	.0594	.0582	.0571	.0559	1	2	4	5	6	7	8	10	11
1.6	.0548	.0537	.0526	.0516	.0505	.0495	.0485	.0475	.0465	.0455	1	2	3	4	5	6	7	8	9
1.7	.0446	.0436	.0427	.0418	.0409	.0401	.0392	.0384	.0375	.0367	1	2	3	4	4	5	6	7	8
1.8	.0359	.0351	.0344	.0336	.0329	.0322	.0314	.0307	.0301	.0294	1	1	2	3	4	4	5	6	6
1.9	.0287	.0281	.0274	.0268	.0262	.0256	.0250	.0244	.0239	.0233	1	1	2	2	3	4	4	5	5
2.0	.0228	.0222	.0217	.0212	.0207	.0202	.0197	.0192	.0188	.0183	0	1	1	2	2	3	3	4	4
2.1	.0179	.0174	.0170	.0166	.0162	.0158	.0154	.0150	.0146	.0143	0	1	1	2	2	2	3	3	4
2.2	.0139	.0136	.0132	.0129	.0125	.0122	.0119	.0116	.0113	.0110	0	1	1	1	2	2	2	3	3
2.3	.0107	.0104	.0102								0	1	1	1	1	2	2	2	2
				.$0^2$990	.$0^2$964	.$0^2$939	.$0^2$914				3	5	8	10	13	15	18	20	23
								.$0^2$889	.$0^2$866	.$0^2$842	2	5	7	9	12	14	16	18	21
2.4	.$0^2$820	.$0^2$798	.$0^2$776	.$0^2$755	.$0^2$734						2	4	6	8	11	13	15	17	19
						.$0^2$714	.$0^2$695	.$0^2$676	.$0^2$657	.$0^2$639	2	4	6	7	9	11	13	15	17
2.5	.$0^2$621	.$0^2$604	.$0^2$587	.$0^2$570	.$0^2$554	.$0^2$539	.$0^2$523	.$0^2$508	.$0^2$494	.$0^2$480	2	3	5	6	8	9	11	12	14
2.6	.$0^2$466	.$0^2$453	.$0^2$440	.$0^2$427	.$0^2$415	.$0^2$402	.$0^2$391	.$0^2$379	.$0^2$368	.$0^2$357	1	2	3	5	6	7	8	9	10
2.7	.$0^2$347	.$0^2$336	.$0^2$326	.$0^2$317	.$0^2$307	.$0^2$298	.$0^2$289	.$0^2$280	.$0^2$272	.$0^2$264	1	2	3	4	5	6	7	8	9
2.8	.$0^2$256	.$0^2$248	.$0^2$240	.$0^2$233	.$0^2$226	.$0^2$219	.$0^2$212	.$0^2$205	.$0^2$199	.$0^2$193	1	1	2	3	4	4	5	6	6
2.9	.$0^2$187	.$0^2$181	.$0^2$175	.$0^2$169	.$0^2$164	.$0^2$159	.$0^2$154	.$0^2$149	.$0^2$144	.$0^2$139	0	1	1	2	2	3	3	4	4
3.0	.$0^2$135	.$0^2$131	.$0^2$126	.$0^2$122	.$0^2$118	.$0^2$114	.$0^2$111	.$0^2$107	.$0^2$104	.$0^2$100	0	1	1	2	2	2	3	3	4

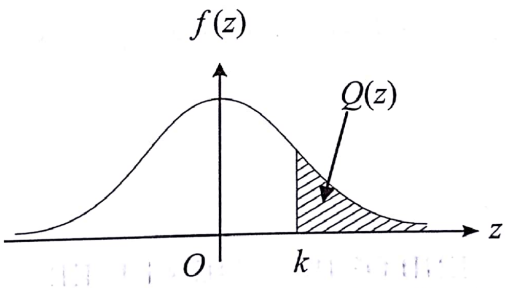
For negative z use relation:

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

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

$P(X > 2{\cdot}1) = Q(2{\cdot}1) = 0{\cdot}0179$

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of **25** questions.
   Kertas peperiksaan 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 peperiksaan.

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. The Upper Tail Probability $Q(z)$ For The Normal Distribution N(0, 1) Table is provided on page **35**.
   Jadual Kebarangkalian Hujung Atas $Q(z)$ *Bagi Taburan Normal* N(0, 1) *disediakan di halaman* **35.**

9. A list of formulae is provided on pages **2** to **4**.
   Satu senarai rumus disediakan pada halaman **2** *hingga* **4**.

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 peperiksaan ini kepada pengawas peperiksaan di akhir peperiksaan.

