NAMA ..... KELAS .....

3472/1
Matematik Tambahan
Kertas 1
Ogos/September
2 jam

MAJLIS PENGETUA SEKOLAH MALAYSIA
NEGERI SEMBILAN
==========
PROGRAM PENINGKATAN AKADEMIK TINGKATAN 5
SEKOLAH-SEKOLAH MENENGAH NEGERI SEMBILAN 2017

MATEMATIK TAMBAHAN
Kertas 1
Dua jam

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1 *Tulis nama dan kelas anda pada ruangan 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* 24.

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

Kertas soalan ini mengandungi 24 halaman bercetak.

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. $S_\infty = \dfrac{a}{1 - r}$

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 generated
Isipadu janaan

$= \int_a^b \pi y^2 \ dx$ 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 $\bar{I} = \dfrac{\sum I_i w_i}{\sum w_i}$

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

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

13 $\sigma = \sqrt{npq}$

14 $z = \dfrac{x - \mu}{\sigma}$

GEOMETRY
GEOMETRI

1 Distance / *Jarak*

$= \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$

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

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

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

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

10 $\tan(A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$

11 $\tan 2A = \frac{2\tan A}{1 - \tan^2 A}$

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

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

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

1 A set of fifteen numbers $x_1, x_2, x_3, ..., x_{15}$ has a standard deviation of $\sqrt{56}$.
Suatu set limabelas nombor-nombor $x_1, x_2, x_3, ..., x_{15}$ *mempunyai sisihan piawai* $\sqrt{56}$.
Find
Cari

(a) the value of $\sum(x-\bar{x})^2$,
nilai $\sum(x-\bar{x})^2$,

(b) the new variance for $\frac{x_1-2}{3}, \frac{x_2-2}{3}, \frac{x_3-2}{3}, ..., \frac{x_{15}-2}{3}$.
varians baru untuk $\frac{x_1-2}{3}, \frac{x_2-2}{3}, \frac{x_3-2}{3}, ..., \frac{x_{15}-2}{3}$. [3 *marks*]

Answer/ *Jawapan*: [3 *markah*]

For Examiner's Use/ *Untuk Kegunaan Pemeriksa*

1
3

[Lihat halaman sebelah

For Examiner's Use/ *Untuk Kegunaan Pemeriksa*

2 (a) State the value of ${}^{n}P_{1}$.
Nyatakan nilai bagi ${}^{n}P_{1}$.

(b) Diagram 2 shows six number cards.
Rajah 2 *menunjukkan enam kad nombor*.

1	2	4	5	8	9

Diagram 2
Rajah 2

Find the numbers of four digit even number which is greater than 5 000 that can be formed from the given cards.
Cari bilangan nombor genap empat digit yang melebihi 5 000 *yang boleh dibentuk daripada kad-kad tersebut.*

[4 *marks*]

Answer/ *Jawapan:* [4 *markah*]

2
4

3 In an archery event, the probability of participant *A* and participant *B* hit the target is $\frac{2}{5}$ and $\frac{1}{3}$ respectively. Find the probability
Dalam suatu acara memanah, kebarangkalian peserta A dan peserta B memanah tepat ke sasaran masing-masing ialah $\frac{2}{5}$ *dan* $\frac{1}{3}$ `. *Carikan kebarangkalian*

(a) both particpants hit the target ,
kedua-dua peserta memanah tepat ke sasaran,

(b) only one participant hits the target.
hanya seorang peserta memanah tepat ke sasaran. [4 *marks*]

Answer/ *Jawapan:* [4 *markah*]

3
4

4 Given that $\int_1^3 h(x)\,dx = k$, where k is a constant. Find

Diberi bahawa $\int_1^3 h(x)\,dx = k$ *dengan keadaan k ialah pemalar. Cari*

(a) $\int_3^1 \frac{h(x)}{5}\,dx$, in terms of *k.*

$\int_3^1 \frac{h(x)}{5}\,dx$ *, dalam sebutan k,*

(*b*) the value of *k* if $\int_1^3 [h(x) - kx]\,dx = 3$

nilai bagi k jika $\int_1^3 [h(x) - kx]\,dx = 3$. [3 *marks*]

Answer/ *Jawapan:* [3 *markah*]

For Examiner's Use/ *Untuk Kegunaan Pemeriksa*

4

3

[Lihat halaman sebelah

For Examiner's Use/ *Untuk Kegunaan Pemeriksa*

5 Given $\frac{d}{dx}\left(\frac{3x+2}{4x-1}\right) = \frac{p}{(4x-1)^2}$, find

Diberi $\frac{d}{dx}\left(\frac{3x+2}{4x-1}\right) = \frac{p}{(4x-1)^2}$, *cari*

(a) $\int \frac{p}{(4x-1)^2}\, dx$,

(b) the value of *p*.
nilai bagi p.

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

Answer/ *Jawapan:*

5

3

6 Diagram 6 shows a cone with a radius of y cm and a slant height of $3y$ cm.
Rajah 6 *menunjukkan sebuah kon dengan jejari* y cm *dan panjang sendeng* $3y$ cm.

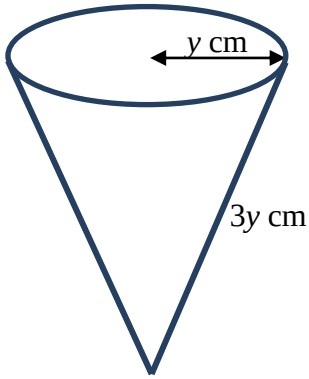


Diagram 6
Rajah 6

Calculate the approximate change in the total surface area of the cone when its radius decreases from 14 cm to 13.88 cm.
Hitung perubahan hampir bagi jumlah luas permukaan kon itu jika jejari kon menyusut dari 14 cm *kepada* 13.88 cm.

[Total surface area of cone $= \pi r^2 + \pi rs$]

[*Jumlah luas permukaan kon* $= \pi j^2 + \pi js$]

[3 *marks*]

Answer/ *Jawapan:* [3 *markah*]

For Examiner's Use/ *Untuk Kegunaan Pemeriksa*

6

3

[Lihat halaman sebelah

For Examiner's Use/ *Untuk Kegunaan Pemeriksa*

7 Diagram 7 shows a circle with centre *O* and radius 10 cm.
Rajah 7 *menunjukkan sebuah bulatan dengan pusat O dan jejari* 10 cm.

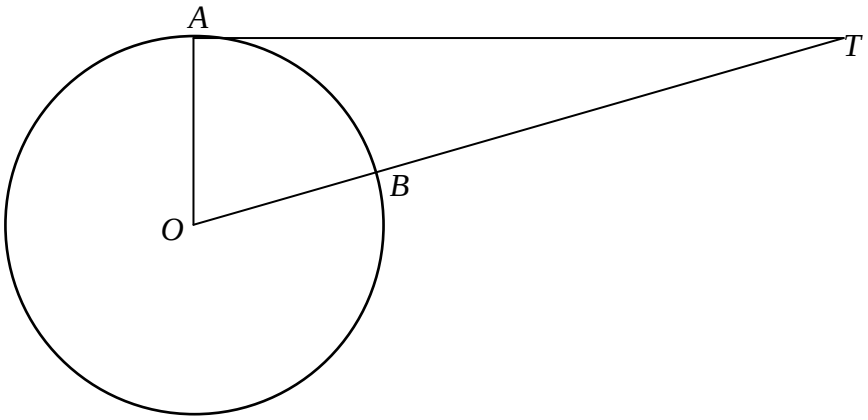


Diagram 7
Rajah 7

AT is a tangent to the circle. Given that the area of triangle *OAT* is 60 cm^2.
Calculate the area of minor sector *OAB*, in cm^2.
AT adalah tangen kepada bulatan. Diberi bahawa luas segi tiga OAT ialah 60 cm^2.
Hitung luas sektor minor OAB, dalam cm^2. [4 *marks*]
Answer/ *Jawapan:* [4 *markah*]

7
4

8 Diagram 8 shows straight line *PR*. *Q* is a point that divides line *PR* in the ratio of *m* : 1.
Rajah 8 *menunjukkan garis lurus PR. Q ialah titik yang membahagi garis PR dalam nisbah m* : 1.

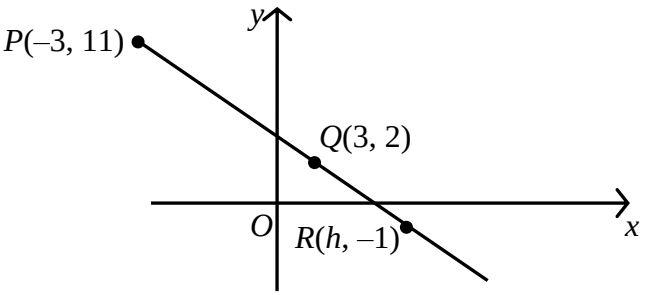


Diagram 8
Rajah 8

Find the value of *m* and of *h*. [3 *marks*]
Cari nilai m dan nilai h. [3 *markah*]
Answer/ *Jawapan*:

For Examiner's Use/ *Untuk Kegunaan Pemeriksa*

8

3

[Lihat halaman sebelah

For Examiner's Use/ *Untuk Kegunaan Pemeriksa*

9 Diagram 9 shows the location of points *A, B, C* and *D* in Cartesian plane.
Rajah 9 *menunjukkan lokasi titik-titik A, B, C dan D pada satah Cartes*.

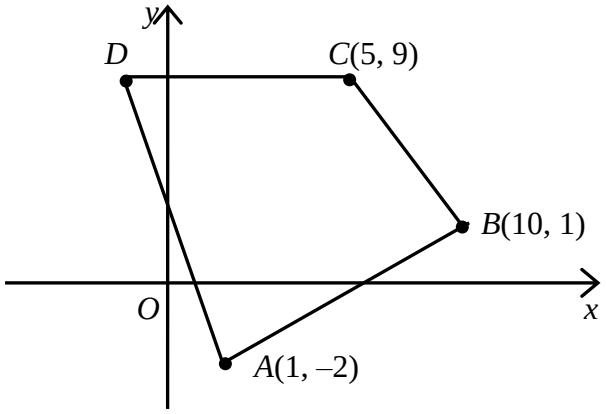


Diagram 9
Rajah 9

Given that point *D* is located on the west side of point *C* and the area of quadrilateral *ABCD* is 87.5 unit^2. Find the coordinates of point *D*.
Diberi bahawa titik D terletak di sebelah barat titik C dan luas sisi empat ABCD ialah 87.5 unit^2. *Cari koordinat-koordinat bagi titik D.* [4 *marks*]
Answer/ *Jawapan*: [4 *markah*]

9
4

10 (a) Solve the trigonometric equation $2\cos x = -1$ for $180° \le x \le 360°$.
Selesaikan persamaan trigonometri $2\kos x = -1$ *untuk* $180° \le x \le 360°$.

(b) Given that $\sin x \cos y = p$ and $\cos x \sin y = q$, express $\dfrac{\tan x}{\tan y}$ in terms of p and q.
Diberi $\sin x \kos y = p$ *dan* $\kos x \sin y = q$, *ungkapkan* $\dfrac{\tan x}{\tan y}$ *dalam sebutan p dan q.*

Answer/ *Jawapan*:

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

For Examiner's Use/ *Untuk Kegunaan Pemeriksa*

10
3

11 Diagram 11 shows function *f*.
Rajah 11 *menunjukkan fungsi f.*

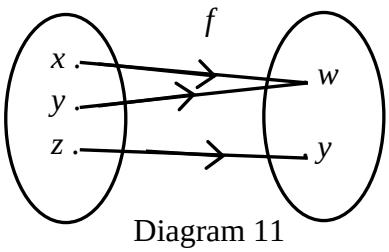


Diagram 11
Rajah 11

(a) State the object of *y*,
Nyatakan objek bagi y,

(b) Does inverse function exist? Give reason for your answer.
Adakah fungsi songsang wujud? Beri sebab untuk jawapan anda.

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

Answer/ *Jawapan*:

11
3

[Lihat halaman sebelah

For Examiner's Use/ *Untuk Kegunaan Pemeriksa*

12 Given that the function $f : x \rightarrow x^2 - 4$. Determine
Diberi bahawa fungsi $f : x \rightarrow x^2 - 4$. *Tentukan*

(a) function g, given composite function $fg(x) = 4x^2 - 12x + 5$,
fungsi g, diberi fungsi gubahan $fg(x) = 4x^2 - 12x + 5$,

(b) the value of $gf(4)$.
nilai bagi $gf(4)$.

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

Answer/ *Jawapan*:

12

4

13 Given the equation $4^n - 1 = 15\,(2^{n-2})$, find the value of n.
Diberi persamaan $4^n - 1 = 15\,(2^{n-2})$, *cari nilai bagi n.*

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

Answer/ *Jawapan*:

13

4

14 Given that $5^x = p$ and $5^y = q$. Express $\log_{25}\frac{p^2}{5q}$ in terms of x and y.

Diberi bahawa $5^x = p$ *dan* $5^y = q$. *Ungkapkan* $\log_{25}\frac{p^2}{5q}$ *dalam sebutan x dan y.*

Answer/ *Jawapan*: [3 *marks*]
[3 *markah*]

For Examiner's Use/ *Untuk Kegunaan Pemeriksa*

14
3

15 Diagram 15(a) shows part of the curve $y = \frac{x}{px^3 - 4x}$. The straight line in Diagram 15(b) is obtained when the curve is reduced to a linear form .

Rajah 15(a) *menunjukkan sebahagian lengkung* $y = \frac{x}{px^3 - 4x}$. *Garis lurus dalam Rajah* 15(b) *diperoleh apabila lengkung tersebut ditukar kepada bentuk linear.*

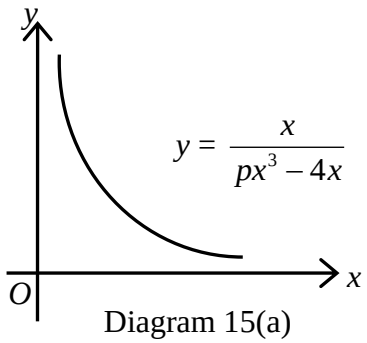


Diagram 15(a)
Rajah 15(a)

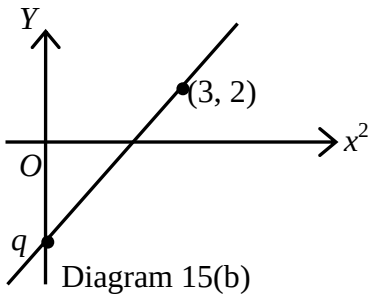


Diagram 15(b)
Rajah 15(b)

The straight line in Diagram 15(b) intercept *Y*-axis at *q*.
Garis lurus pada Rajah 15(b) *memintas paksi-Y pada q.*

(a) Write *Y*-axis in terms of *x* or/and *y*.
Tulis paksi-Y dalam sebutan x atau/dan y.

(b) State the value of *p* and *q*.
Nyatakan nilai bagi p dan q. [4 *marks*]

Answer/ *Jawapan*: [4 *markah*]

15
4

[Lihat halaman sebelah

For Examiner's Use/ *Untuk Kegunaan Pemeriksa*

16 Given that one of the roots of the quadratic equation $(4 + n)x^2 - (8 + 4n)x - 50 = 0$ is negative value of the other root.
Diberi bahawa salah satu punca bagi persamaan kuadratik $(4 + n)x^2 - (8 + 4n)x - 50 = 0$ *ialah nilai negatif bagi punca yang satu lagi*.

Find
Cari

(a) the value of *n*,
nilai bagi n,

(b) the roots of the quadratic equation.
punca-punca persamaan kuadratik tersebut.

[3 *marks*]

Answer/ *Jawapan*: [3 *markah*]

16

3

17 Given that $h + 4$ is one of the roots of the quadratic equation $x^2 - hx = 8$.
Determine the value of *h*.
Diberi bahawa $h + 4$ *ialah salah satu punca bagi persamaan kuadratik* $x^2 - hx = 8$.
Tentukan nilai bagi h. [2 *marks*]

Answer/ *Jawapan*: [2 *markah*]

17

2

18 Diagram 18 shows the graph of quadratic function $f(x) = (2p - 7)x^2 - px + 2x + 1$.
Rajah 18 *menunjukkan graf bagi fungsi kuadratik* $f(x) = (2p - 7)x^2 - px + 2x + 1$.

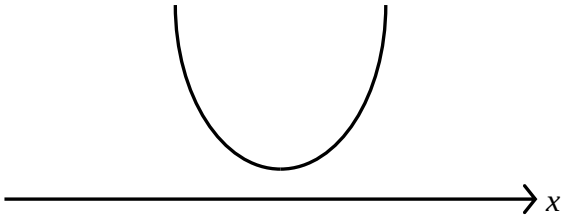


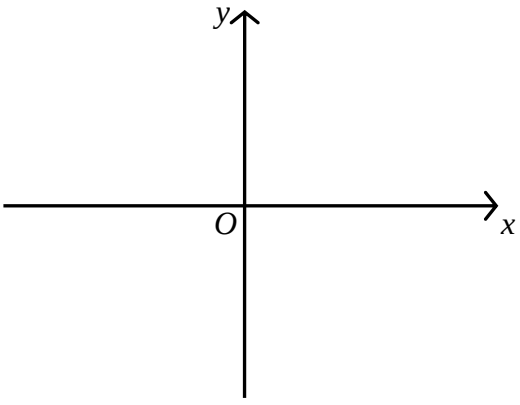
Diagram 18
Rajah 18

Find the range of values of p.
Cari julat nilai bagi p. [3 *marks*]
Answer/ *Jawapan*: [3 *markah*]

For Examiner's Use/ *Untuk Kegunaan Pemeriksa*

18
3

19 Sketch the graph of quadratic function $f(x) = -(x - 4)^2 + 10$ in the answer space and state the turning point in your graph.
Lakarkan graf fungsi kuadratik $f(x) = -(x - 4)^2 + 10$ *pada ruang jawapan dan nyatakan titik pusingan pada graf anda*. [3 *marks*]
Answer/ *Jawapan*: [3 *markah*]



19
3

[Lihat halaman sebelah

For Examiner's Use/ *Untuk Kegunaan Pemeriksa*

20 Diagram 20 shows the location of Azy's house and her school on a Cartesian plane.
Rajah 20 *menunjukkan lokasi rumah Azy dan sekolahnya dalam satah Cartes.*

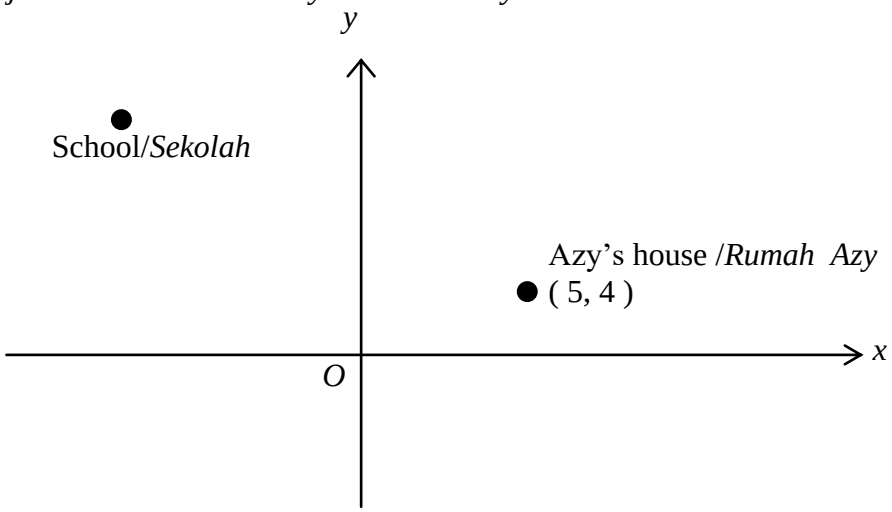


Diagram 20
Rajah 20

It is given that the shortest distance of Azy's house from the *x*-axis is 4 km and the vector from Azy's house to her school is $-12\underline{i}+9\underline{j}$. Find

Diberi bahawa jarak terpendek rumah Azy dari paksi-x ialah 4 km *dan vektor dari rumah Azy ke sekolahnya ialah* $-12\underline{i}+9\underline{j}$. *Cari*

(a) the location of Azy's school,
lokasi sekolah Azy,
(b) the distance between Azy's house to her school.
jarak di antara rumah Azy dan sekolahnya. [3 *marks*]

Answer/ *Jawapan*: [3 *markah*]

20
3

21 Given $\underline{p} = \begin{pmatrix} 4 \\ -9 \end{pmatrix}$ and $\underline{q} = \begin{pmatrix} 2k \\ k+3 \end{pmatrix}$, find the value of k such that $\underline{p} + \underline{q}$ is parallel to x-axis .

Diberi $\underline{p} = \begin{pmatrix} 4 \\ -9 \end{pmatrix}$ *dan* $\underline{q} = \begin{pmatrix} 2k \\ k+3 \end{pmatrix}$, *cari nilai bagi* k *dengan keadaan* $\underline{p} + \underline{q}$ *adalah selari dengan paksi-x.*

[2 *marks*]

Answer/ *Jawapan*: [2 *markah*]

For Examiner's Use/ *Untuk Kegunaan Pemeriksa*

21

2

[Lihat halaman sebelah

For Examiner's Use/ *Untuk Kegunaan Pemeriksa*

22 Given that the first term and the sum of infinity of a geometric progression is 10 and 25 respectively. Find the common ratio of the progression.
Diberi bahawa sebutan pertama dan hasil tambah ketakterhinggaan suatu janjang geometri masing-masing ialah 10 *dan* 25. *Cari nisbah sepunya janjang tersebut*.
Answer/ *Jawapan*: [2 *marks*]
[2 *markah*]

22
2

23 Given that the sum of an arithmetic progression is $S_n = 6n - n^2$.
Determine the common difference of the progression.
Diberi bahawa hasil tambah suatu janjang aritmetik ialah $S_n = 6n - n^2$.
Tentukan beza sepunya bagi janjang tersebut.
[3 *marks*]
Answer/ *Jawapan*: [3 *markah*]

23
3

24 Hafiz wishes to make a housing investment as his own saving. He has compared two housing area, Taman Cempaka and Taman Kemboja. A unit of a house at Taman Cempaka costs RM420 000 and the value of the house will increase 1.5% each year. A unit of a house located at Taman Kemboja costs RM400 000 and its value is estimated to increase 1.8% each year. If Hafiz plans to keep the investment for 20 years, which housing area should Hafiz choose and what is the value of the house after 20 years?
[Round off your answer to the nearest RM]
Hafiz ingin membuat pelaburan dalam perumahan sebagai perancangan simpanan beliau. Beliau telah membuat perbandingan nilai rumah bagi dua kawasan iaitu Taman Cempaka dan Taman Kemboja. Harga seunit rumah di Taman Cempaka ialah RM420 000 *dan nilai rumah dijangka meningkat sebanyak* 1.5% *setiap tahun. Harga seunit rumah di Taman Kemboja ialah* RM400 000 *dan harganya dijangka meningkat sebanyak* 1.8% *setiap tahun. Jika Hafiz ingin menyimpan pelaburannya selama* 20 *tahun, rumah di kawasan manakah yang patut Hafiz pilih dan berapakah nilai rumah itu selepas* 20 *tahun*?
[*Bundarkan jawapan anda kepada* RM *terhampir*] [3 *marks*]
Answer/ *Jawapan*: [3 *markah*]

For Examiner's Use/ *Untuk Kegunaan Pemeriksa*

24

3

[Lihat halaman sebelah

For Examiner's Use/ *Untuk Kegunaan Pemeriksa*

25 The marks in Mathematics test for a group of students are normally distributed. Diagram 25 shows a graph of the marks, where PQ is the axis of symmetry of the graph.
Markah dalam ujian Matematik bagi sekumpulan murid bertabur secara normal. Rajah 25 *menunjukkan graf markah, di mana PQ ialah paksi simetri bagi graf tersebut.*

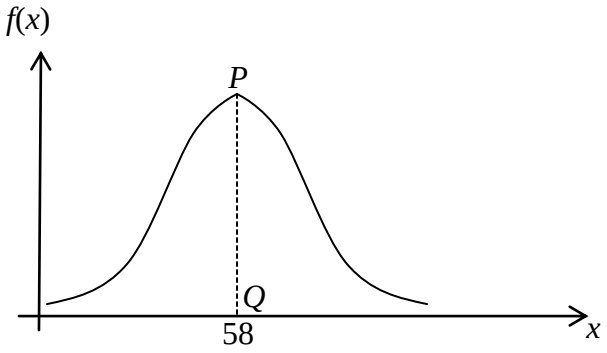


Diagram 25
Rajah 25

The standard deviation of the marks is 2.2. If 4.85% of the students obtained marks less than k, find the value of k.
Sisihan piawai bagi markah tersebut ialah 2.2. *Jika* 4.85% *daripada murid memperoleh markah kurang daripada k, cari nilai bagi k.* [4 *marks*]
Answer/ *Jawapan*: [4 *markah*]

25
4

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

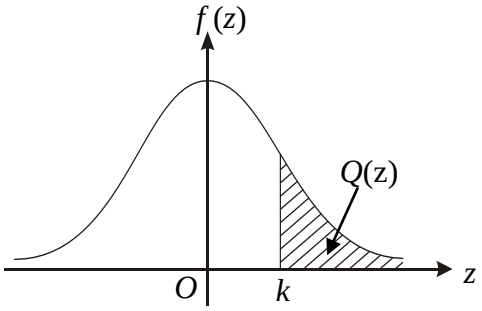
THE UPPER TAIL PROBABILITY Q(z) FOR THE NORMAL DISTRIBUTION N(0, 1)
***KEBARANGKALIAN HUJUNG ATAS Q(z) BAGI TABURAN NORMAL* N(0, 1)**

z	0	1	2	3	4	5	6	7	8	9	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

For negative *z* use relation :
Bagi z negative gunahubungan :
$Q(z) = 1 - Q(-z) = P(-z)$

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

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



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 this question paper.
   Tulis jawapan anda pada 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 baru.

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 23.
   Jadual Kebarangkalian Hujung Atas $Q(z)$ *Bagi Taburan Normal* N(0, 1) *disediakan di halaman* 23.

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 pada akhir peperiksaan.