NAMA | TINGKATAN

PROGRAM GEMPUR KECEMERLANGAN
SIJIL PELAJARAN MALAYSIA 2020
ANJURAN BERSAMA
MAJLIS PENGETUA SEKOLAH MALAYSIA
NEGERI PERLIS
DAN
MAJLIS GURU CEMERLANG NEGERI PERLIS

SIJIL PELAJARAN MALAYSIA 2020 3472/1

MATEMATIK TAMBAHAN

Kertas 1
Oktober
2 jam **Dua jam**

JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

1. *Tulis* **nama** *dan* **tingkatan** *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	3	
2	3	
3	4	
4	4	
5	3	
6	3	
7	3	
8	2	
9	3	
10	3	
11	3	
12	4	
13	2	
14	3	
15	3	
16	3	
17	3	
18	3	
19	3	
20	3	
21	4	
22	4	
23	4	
24	3	
25	4	
Jumlah	**80**	

Kertas peperiksaan ini mengandungi 26 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 $S_n = \dfrac{n}{2}\left[2a + (n-1)d\right]$

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)

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

GEOMETRY / *GEOMETRI*

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

2 Mid Point / *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 $|\underset{\sim}{\mathbf{r}}| = \sqrt{x^2 + y^2}$

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

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

TRIGONOMETRY/ *TRIGONOMETRI*

1 Arc length, $s = r\theta$

Panjang lengkok, $s = j\theta$

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

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

3 $\sin^2 A + \cos^2 A = 1$

4 $\sec^2 A = 1 + \tan^2 A$

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

6 $\sin 2A = 2 \sin A \cos A$

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

8 $\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$

9 $\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$

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

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

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

13 $a^2 = b^2 + c^2 - 2bc \cos A$

14 Area of triangle / *Luas segitiga*

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

[Lihat halaman sebelah

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

1 Mean for these numbers 5, 2, 5, 2, 2, 6, x, y is 4.
Min bagi nombor-nombor 5, 2, 5, 2, 2, 6, x, y *ialah* 4.

(*a*) Show that $x + y = 10$.
Tunjukkan bahawa $x + y = 10$.

(*b*) Hence, state the mode for the numbers if,
Seterusnya, nyatakan mod bagi nombor-nombor itu jika,

(i) $x = y$,

(ii) $x \neq y$.

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

Answer / *Jawapan*:

(*a*)

(*b*) (i)

(ii)

1

3

For Examiner's Use

2 A set of data 1, *p*, *q*, 3, *r*, *s*, 8 is arranged in increasing order. The range, mean and variance of the set of data are 7, 3 and 5 respectively. Determine the effect on

Satu set data 1, *p*, *q*, 3, *r*, *s*, 8 *disusun mengikut tertib menaik. Julat, min dan varians bagi set data itu masing-masing ialah* 7, 3 *dan* 5. *Tentukan kesan terhadap*

(*a*) the range when number 10 is added,
julat apabila nombor 10 *dimasukkan,*

(*b*) the interquartile range when number 3 is removed,
julat antara kuartil apabila nombor 3 *dikeluarkan,*

(*c*) the variance when number 3 is added.
varians apabila nombor 3 *dimasukkan*.

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

Answer / *Jawapan*:

(*a*)

(*b*)

(c)

2

3

3 Without using the calculator, find the value for

Tanpa menggunakan kalkulator, cari nilai bagi

(*a*) ${}^5P_3$,

(*b*) ${}^5C_3$.

Hence, or by using other method, show that ${}^5P_3 = {}^5C_3 \times 3!$.

Seterusnya, atau dengan cara lain, tunjukkan bahawa ${}^5P_3 = {}^5C_3 \times 3!$.

[4 *marks*]

[4 *markah*]

Answer / *Jawapan*:

(*a*)

(*b*)

3

4

For Examiner's Use

4 Given $X = \{1, 3, 5\}$, $Y = \{4, 6, 8\}$ and $Z = \left\{\frac{x}{y} : x \in X,\ y \in Y\right\}$.

Diberi $X = \{1, 3, 5\}$, $Y = \{4, 6, 8\}$ *dan* $Z = \left\{\frac{x}{y} : x \in X,\ y \in Y\right\}$.

List the nine elements of *Z*. If an element from *Z* has been chosen randomly, find the probability that the element is

Senaraikan sembilan unsur bagi Z. Jika suatu unsur dari Z dipilih secara rawak, carikan kebarangkalian bahawa unsur itu adalah

(*a*) less than $\frac{1}{3}$,

kurang daripada $\frac{1}{3}$,

(*b*) more than $\frac{3}{4}$,

lebih daripada $\frac{3}{4}$,

(*c*) less than $\frac{1}{3}$ or more than $\frac{3}{4}$.

kurang daripada $\frac{1}{3}$ *atau lebih daripada* $\frac{3}{4}$.

[4 *marks*]

[4 *markah*]

Answer / *Jawapan*:

(*a*)

(*b*)

(*c*)

4

4

5 Diagram 1 shows a standard normal distribution graph.

Rajah 1 *menunjukkan suatu graf taburan normal piawai*.

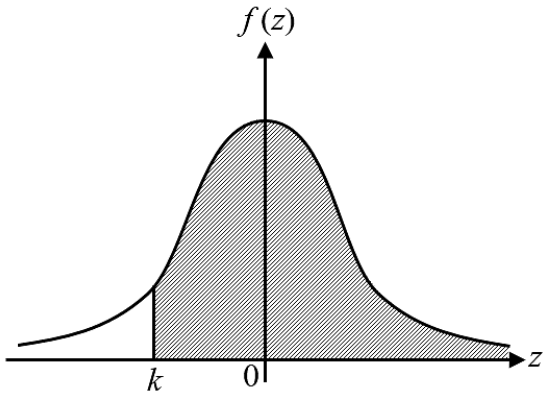

Diagram 1

Rajah 1

The probability represented by the area of the shaded region is 0.76.

Kebarangkalian yang diwakili oleh luas kawasan berlorek ialah 0.76.

(*a*) Find $P(k \le Z \le 0)$.

Cari $P(k \le Z \le 0)$,

(*b*) *X* is a continuos random variable which is normally distributed with a mean μ and variance of 225. Find the value of μ when the value of *X* is 57.7 correspond to the *z*-score is *k*.

X ialah pemboleh ubah rawak selanjar yang bertaburan secara normal dengan min μ *dan varians* 225. *Cari nilai* μ *apabila nilai X ialah* 57.7 *sepadan dengan skor-z ialah k.*

[3 *marks*]

[3 *markah*]

Answer / *Jawapan*:

(*a*)

(*b*)

5

3

For Examiner's Use

6 Diagram 2 shows two straight lines on a Cartesian plane.

Rajah 2 *menunjukkan dua garis lurus pada suatu satah Cartes*.

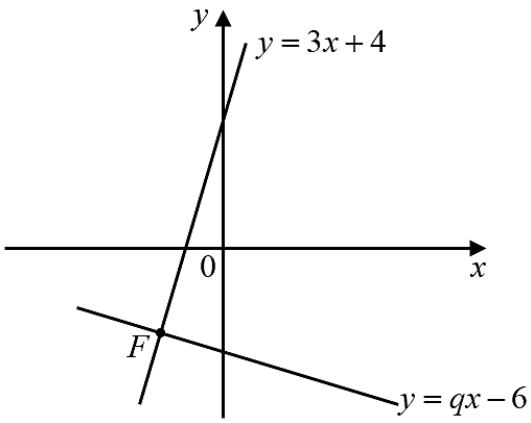

Diagram 2
Rajah 2

Both the straight lines are perpendicular to each other.

Kedua-dua garis lurus itu berserenjang antara satu sama lain.

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

(*b*) Find the coordinates of *F*.
Cari koordinat F.

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

Answer / *Jawapan*:

(*a*)

(*b*)

6
3

7 A straight line $\frac{x}{6}-\frac{y}{8}=1$ cuts the x-axis at P and y-axis at Q.

Garis lurus $\frac{x}{6}-\frac{y}{8}=1$ *memotong paksi-x di P dan paksi-y di Q.*

Find

Cari

(*a*) the gradient of the straight line,
kecerunan garis lurus,

(*b*) the equation of the perpendicular bisector of the straight line.
persamaan pembahagi dua sama serenjang garis lurus itu.

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

Answer / *Jawapan*:

(*a*)

(*b*)

7

3

For Examiner's Use

8 Diagram 3 shows the vectors $\overrightarrow{OR}$, $\overrightarrow{OS}$, $\overrightarrow{OP}$ and $\overrightarrow{PQ}$ drawn on a grid of equal squares with sizes of 1 unit. It is given that $\overrightarrow{OR} = \underline{r}$ and $\overrightarrow{OS} = \underline{s}$.

Rajah 3 *menunjukkan vektor* $\overrightarrow{OR}$, $\overrightarrow{OS}$, $\overrightarrow{OP}$ *dan* $\overrightarrow{PQ}$ *yang dilukis pada grid segi empat sama yang bersaiz* 1 unit. *Diberi bahawa* $\overrightarrow{OR} = \underline{r}$ *dan* $\overrightarrow{OS} = \underline{s}$.

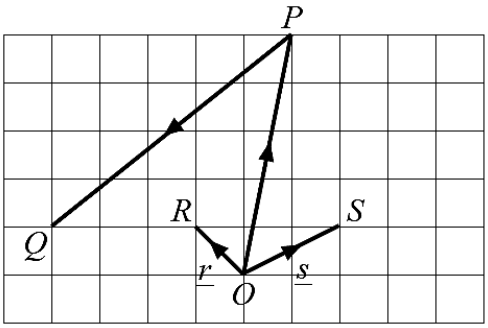

Diagram 3
Rajah 3

Determine
Tentukan

(*a*) $\left|\overrightarrow{OP}\right|$.

(*b*) $\overrightarrow{PQ}$ in terms of $\underline{r}$ and $\underline{s}$.
$\overrightarrow{PQ}$ dalam sebutan $\underline{r}$ dan $\underline{s}$.

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

Answer / *Jawapan*:

(*a*)

(*b*)

8

2

9 Points *P*, *Q* and *R* are collinear with $\overrightarrow{PQ} = \underline{m}$ and $\overrightarrow{QR} = (p-3)\underline{m}$.

Find the value of *p* if $\overrightarrow{PQ} = \frac{2}{3}\overrightarrow{PR}$, where *p* is a constants.

Titik-titik P, Q dan R adalah segaris dengan $\overrightarrow{PQ} = \underline{m}$ *dan* $\overrightarrow{QR} = (p-3)\underline{m}$.

Cari nilai p jika $\overrightarrow{PQ} = \frac{2}{3}\overrightarrow{PR}$, *dengan keadaan p ialah pemalar*.

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

Answer / *Jawapan*:

9

3

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10 Diagram 4 shows the relation between Set *P* and Set *Q*.
Rajah 4 *menunjukkan hubungan Set P dan Set Q*.

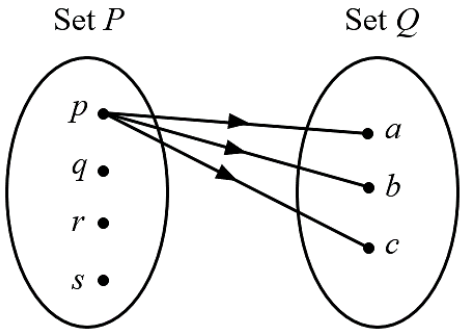


Diagram 4
Rajah 4

(*a*) State the codomain of the relation.
Nyatakan kodomain hubungan itu.

(*b*) Is the relation a function? Explain.
Adakah hubungan tersebut suatu fungsi? *Jelaskan*.

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

For Examiner's Use

Answer / *Jawapan*:

(*a*)

(*b*)

10

3

11 Given $f^{-1}: x \to x-7$ and $g: x \to x^2+9x-25$.

Diberi $f^{-1}: x \to x-7$ *dan* $g: x \to x^2+9x-25$.

Find

Cari

(*a*) $f(5)$,

(*b*) $gf(x)$.

[3 *marks*]

[3 *markah*]

Answer / *Jawapan*:

(*a*)

(*b*)

11

3

12 Diagram 5 shows the graphs of two quadratic function, $y = g(x)$ and $y = h(x)$.

Both graphs intersect the *x*-axis at the origin *O* and $(8, 0)$.

Rajah 5 *menunjukkan graf bagi dua fungsi kuadratik,* $y = g(x)$ *dan* $y = h(x)$. *Kedua-dua graf itu menyilang paksi-x pada asalan O dan* $(8, 0)$.

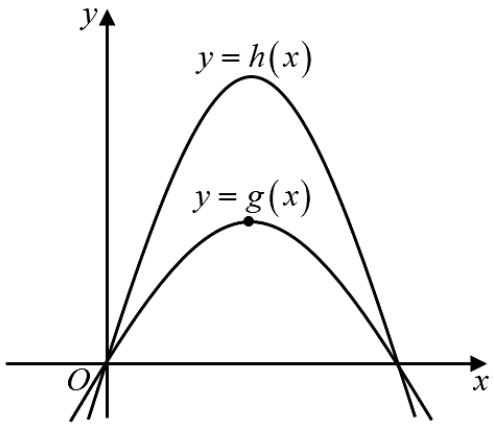


Diagram 5
Rajah 5

(*a*) Given that $g(x) = 8x - x^2$, determine the coordinates of the turning point, *V* for $g(x)$.

Diberi $g(x) = 8x - x^2$, *tentukan koordinat titik pusingan, V bagi* $g(x)$.

(*b*) Given the maximum value of $h(x)$ is twice the maximum value of $g(x)$. Find the function $h(x)$ in form $a(x+b)^2 + c$.

Diberi bahawa nilai maksimum bagi $h(x)$ *adalah dua kali nilai maksimum bagi* $g(x)$. *Cari fungsi* $h(x)$ *dalam bentuk* $a(x+b)^2 + c$.

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

Answer / *Jawapan*:

(*a*)

(*b*)

12

4

For Examiner's Use

13 Given the quadratic equation $\left(m^2+1\right)x^2-2mnx+n^2=0$, where *m* and *n* are real numbers.

Show that the equation has no real roots for any value of *m* and of *n*.

Diberi persamaan kuadratik $\left(m^2+1\right)x^2-2mnx+n^2=0$, *di mana m dan n adalah nombor-nombor nyata*.

Tunjukkan bahawa persamaan tersebut tidak mempunyai punca nyata bagi sebarang nilai m dan nilai n.

[2 *marks*]

[2 *markah*]

Answer / *Jawapan*:

13

2

14 Given $y=x^2-px-16$ and $y\le 0$ if $-2\le x\le q$. Find the value of *p* and of *q*.

Diberi $y=x^2-px-16$ *dan* $y\le 0$ *jika* $-2\le x\le q$. Cari nilai *p* dan nilai *q*.

[3 *marks*]

[3 *markah*]

Answer / *Jawapan*:

14

3

15 Given α and β are the roots of quadratic equation $ax^2 + bx + c = 0$.

Diberi α *dan* β *ialah punca-punca bagi persamaan* $ax^2 + bx + c = 0$.

(*a*) Find the value of $\alpha^2 + \beta^2$ in terms of *a*, *b* and *c*.

Cari nilai $\alpha^2 + \beta^2$ *dalam sebutan a, b dan c.*

(*b*) Hence, form the quadratic equation with roots α^2 and β^2.

Seterusnya, bentukkan persamaan kuadratik yang mempunyai punca-punca α^2 *dan* β^2.

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

Answer / *Jawapan*:

(*a*)

(*b*)

15

3

For Examiner's Use

16 A curve has an equation $y = \frac{4}{x} + \frac{5x}{2}$. Find the equation of the tangent to the curve at point $(1, 5)$. [3 *marks*]

Suatu lengkung mempunyai persamaan $y = \frac{4}{x} + \frac{5x}{2}$. *Cari persamaan tangen kepada lengkung tersebut pada titik* $(1, 5)$. [3 *markah*]

Answer / *Jawapan*:

16 3

17 Given that $2\log_y x = 8\log_x y$, express x in terms of y. [3 *marks*]

Diberi $2\log_y x = 8\log_x y$, *ungkapkan x dalam sebutan y*. [3 *markah*]

Answer / *Jawapan*:

17 3

18 Given that $16^m = 4^{m+1} - 4$, find the value of *m*. [3 *marks*]

Diberi bahawa $16^m = 4^{m+1} - 4$, *cari nilai m.* [3 *markah*]

Answer / *Jawapan*:

18

3

19 Given that $\sin\theta$, $2\cos\theta$ and $2\sin\theta$ are three consecutive terms of an arithmetic progression.

Show that $\tan\theta = \frac{4}{3}$. [3 *marks*]

Diberi bahawa $\sin\theta$, $2\text{kos}\theta$ *dan* $2\sin\theta$ *adalah tiga sebutan berturut-turut bagi satu janjang aritmetik.*

Tunjukkan bahawa $\tan\theta = \frac{4}{3}$. [3 *markah*]

Answer / *Jawapan*:

19

3

For Examiner's Use

20 The sum of the first *n* terms of an arithmetics progression is given by $S_n = \frac{n}{2}(3n+1)$.

Hasil tambah n sebutan pertama bagi suatu janjang aritmetik diberi oleh $S_n = \frac{n}{2}(3n+1)$.

Find

Cari

(*a*) the sum of the first 5 terms,

Hasil tambah 5 *sebutan pertama*,

(*b*) the 5^{th} terms.

sebutan ke-5.

[3 *marks*]

[3 *markah*]

Answer / *Jawapan*:

(*a*)

(*b*)

20

3

21 Diagram 6 shows the variables, *x* and *y* are related by the equation $y = \frac{8^x}{h}$, where *h* is a constant. A straight line graph is obtained by plotting $\log_2 y$ against *x*.

Rajah 6 *menunjukkan pemboleh ubah, x dan y yang dihubungkan oleh persamaan* $y = \frac{8^x}{h}$, *di mana h ialah pemalar. Satu graf garis lurus yang diperoleh dengan memplotkan* $\log_2 y$ *melawan x.*

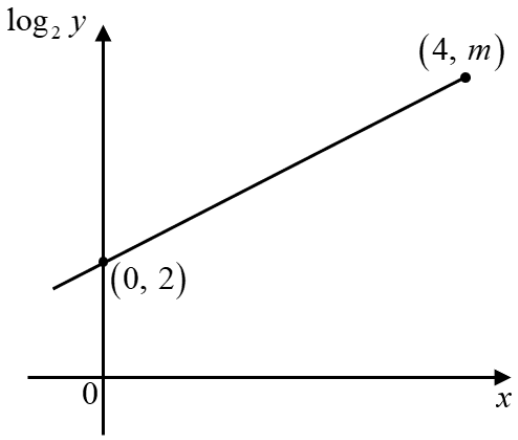


Diagram 6
Rajah 6

(*a*) Convert the equation $y = \frac{8^x}{h}$ to linear form.

Tukarkan persamaan $y = \frac{8^x}{h}$ *kepada bentuk linear.*

(*b*) Find the value of *h* and of *m*.
Cari nilai h dan nilai m.

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

Answer / *Jawapan*:

(*a*)

(*b*)

21
4

For Examiner's Use

22 If $y = x\sqrt{1+x^2}$, find $\frac{dy}{dx}$. Hence, find the value of $\frac{dy}{dx}$, when $x = \sqrt{3}$.

[4 *marks*]

Jika $y = x\sqrt{1+x^2}$, *cari* $\frac{dy}{dx}$. Seterusnya, *cari nilai* $\frac{dy}{dx}$ *apabila* $x = \sqrt{3}$.

[4 *markah*]

Answer / *Jawapan*:

22

4

23 Differentiate $\frac{3x^2 - 4\sqrt{x}}{x}$ with respect to x.

Hence, find the value of $\int_1^9 \frac{3x^2 + 2\sqrt{x}}{2x^2} \mathrm{d}x$. [4 *marks*]

Bezakan $\frac{3x^2 - 4\sqrt{x}}{x}$ *terhadap* x.

Seterusnya cari nilai bagi $\int_1^9 \frac{3x^2 + 2\sqrt{x}}{2x^2} \mathrm{d}x$. [4 *markah*]

Answer / *Jawapan*:

23

4

For Examiner's Use

24 Solve the equation $5\tan^2 x = \sec^2 x + 3\tan x$ for $0^\circ \le x \le 360$. [3 *marks*]

Selesaikan persamaan $5\tan^2 x = \text{sek}^2 x + 3\tan x$ *untuk* $0^\circ \le x \le 360$. [3 *markah*]

Answer / *Jawapan*:

24

3

25 Diagram 7 shows two sectors, *OAB* and *OCD* with common centre *O*.
Rajah 7 *menunjukkan sektor OAB dan OCD dengan pusat sepunya O*.

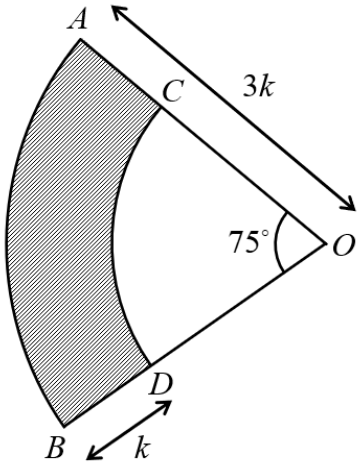


Diagram 7
Rajah 7

Find
Cari

(*a*) the value of *k* if the area of the shaded region is 13.09 cm^2,
nilai k jika luas kawasan berlorek ialah 13.09 cm^2,

(*b*) the perimeter of the shaded region.
perimeter kawasan berlorek.

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

Answer / *Jawapan*:

(*a*)

(*b*)

25

4

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)

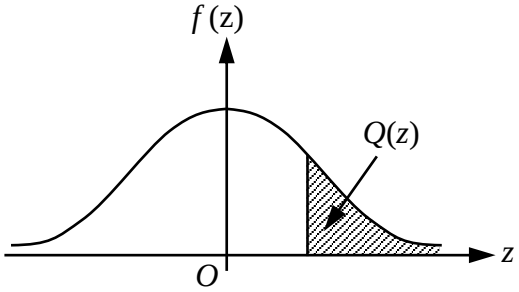
z	0	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
											Minus / *Tolak*								
0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641	4	8	12	16	20	24	28	32	36
0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247	4	8	12	16	20	24	28	32	36
0.2	0.4207	0.4168	0.4129	0.4090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

   Satu senarai rumus disediakan di halaman **2** *dan* **3**.

9. The Upper Tail Probability Q(*z*) For The Normal Distribution N(0, 1) Table is provided on page **25**.

   Jadual Kebarangkalian Hujung Atas Q(z) *bagi Taburan Normal* N(0, 1) *disediakan di halaman* **25**.

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.

