

SULIT

NO. KAD PENGENALAN

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ANGKA GILIRAN

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Nama

Tingkatan



JABATAN PELAJARAN NEGERI SELANGOR
PERSIDANGAN KEBANGSAAN PENGETUA SEKOLAH MENENGAH



PROGRAM PENINGKATAN PRESTASI AKADEMIK (2)
SIJIL PELAJARAN MALAYSIA 2010

3472/1

ADDITIONAL MATHEMATICS

Kertas 1

Sept./Okt.

2 jam

Dua Jam

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Tuliskan nombor kad pengenalan, angka giliran, nama dan tingkatan 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 arahan di halaman belakang kertas soalan ini.*

<i>Kod Pemeriksa</i>		
Soalan	Markah Penuh	Markah Diperoleh
1	3	
2	4	
3	3	
4	2	
5	3	
6	3	
7	3	
8	3	
9	3	
10	2	
11	3	
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13	4	
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15	3	
16	2	
17	3	
18	4	
19	3	
20	4	
21	4	
22	3	
23	4	
24	4	
25	4	
Jumlah	80	

Kertas soalan ini mengandungi 20 halaman bercetak.

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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/ALGEBRA

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GEOMETRY / GEOMETRI

1 Distance / Jarak

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

2 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 Area of triangle / Luas segi tiga

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

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

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

STATISTICS / STATISTIK

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

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

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

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

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

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

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

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

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

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

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

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

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

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

TRIGONOMETRY / TRIGONOMETRI

$$1 \quad \text{Arc length, } s = r\theta$$

Panjang lengkok, $s = r\theta$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$14 \quad \text{Area of triangle / Luas segi tiga}$$

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

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Answer all questions.
Jawab semua soalan.

- 1 Diagram 1 shows the graph of the function $y = f(x)$ where $f(x) = |2x + 3|$, for the domain $-2 \leq x \leq 5$.

Rajah 1 menunjukkan graf bagi fungsi $y = f(x)$ dengan keadaan $f(x) = |2x + 3|$, untuk domain $-2 \leq x \leq 5$.

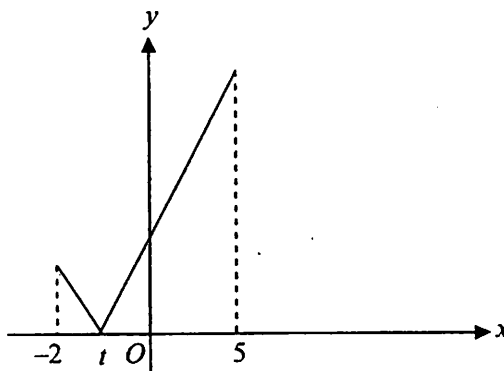
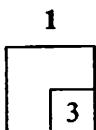


Diagram 1
Rajah 1

State
Nyatakan

- (a) the value of t ,
nilai t ,
- (b) the range of $f(x)$ corresponding to the given domain.
julat $f(x)$ berdasarkan domain yang diberi.

[3 marks]
[3 markah]



Answer / Jawapan : (a) $t = \dots\dots\dots$

(b) $\dots\dots\dots$

2 Given the inverse function $f^{-1}(x) = \frac{2x-3}{2}$, find the value of

Diberi fungsi songsang $f^{-1}(x) = \frac{2x-3}{2}$, cari nilai

(a) $f(4)$,

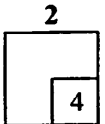
(b) k if $f^{-1}(2k) = \frac{1}{2}$.

k jika $f^{-1}(2k) = \frac{1}{2}$.

[4 marks]
[4 markah]

Answer / Jawapan : (a).....

(b) $k =$



3 Given the functions $f : x \rightarrow 4x - 1$ and $g : x \rightarrow 2ax - b$, where a and b are constants.
Diberi fungsi $f : x \rightarrow 4x - 1$ dan $g : x \rightarrow 2ax - b$, dengan keadaan a dan b ialah pemalar.

Find
Cari

(a) $f^2(x)$,

(b) the value of a and of b such that if $f^2(x) = g(x)$.

nilai a dan nilai b dengan keadaan jika $f^2(x) = g(x)$.

[3 marks]
[3 markah]

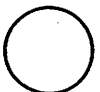
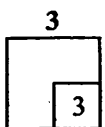
Answer / Jawapan : (a)

(b) $a =$

$b =$

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4 Form a quadratic equation which has the roots 6 and $-\frac{1}{2}$. Give your answer in the general form $ax^2 + bx + c = 0$, where a , b and c are constants. [2 marks]

Bentukkan satu persamaan kuadratik yang mempunyai punca-punca 6 dan $-\frac{1}{2}$.

Berikan jawapan anda dalam bentuk $ax^2 + bx + c = 0$, dengan keadaan a , b dan c adalah pemalar. [2 markah]

4



Answer / Jawapan :

5 Find the range of values of k for which the function $f(x) = x^2 + kx + 2k - 3$ does not intersect the x -axis. [3 marks]

Cari julat nilai-nilai k jika fungsi $f(x) = x^2 + kx + 2k - 3$ tidak bersilang dengan paksi- x . [3 markah]

5



Answer / Jawapan :

- 6 The quadratic function $f(x) = x^2 + 4x - 1$ can be expressed in the form $f(x) = (x - p)^2 + q$, where p and q are constants.

Fungsi kuadratik $f(x) = x^2 + 4x - 1$ boleh diungkapkan dalam bentuk $f(x) = (x - p)^2 + q$, dengan keadaan p dan q ialah pemalar.

Find the value of p and of q .

[3 marks]

Cari nilai p dan nilai q .

[3 markah]

Answer / Jawapan : $p =$

$q =$

6

3

- 7 Solve the equation :

Selesaikan persamaan :

$$3^{x+3} - 3^{x+2} = 2$$

[3 marks]

[3 markah]

Answer / Jawapan : $x =$

7

3

- 8 Given that $2^{\log_3 x} = 32$, find the value of x .

[3 marks]

Diberi $2^{\log_3 x} = 32$, cari nilai x .

[3 markah]

Answer / Jawapan : $x =$

8

3

[Lihat halaman sebelah

SULIT

- 9 Three consecutive terms of a geometric progression are $y - 1$, $y + 3$ and $2y$.
If all the terms are positive, find the common ratio of the progression. [3 marks]
*Tiga sebutan berturut-turut bagi suatu jangjang geometri ialah $y - 1$, $y + 3$ dan $2y$.
Jika semua sebutan adalah positif, cari nisbah sepunya jangjang itu. [3 markah]*

9



Answer / Jawapan :

- 10 9, 27, 54, ... is a geometric progression.
Given that the n^{th} term is 729, find the value of n . [2 marks]
*9, 27, 54, ... ialah suatu jangjang geometri.
Diberi sebutan ke- n ialah 729, cari nilai n . [2 markah]*

10



Answer / Jawapan : $n =$

11 The sum of the first n terms of an arithmetic progression is given by $S_n = 6n - n^2$.
Find the 4th term of the progression. [3 marks]

Diberi hasil tambah n sebutan pertama suatu jangjang aritmetik ialah $S_n = 6n - n^2$.
Cari sebutan ke-4 jangjang itu. [3 markah]

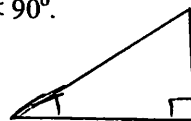
Answer / Jawapan :

11

3

12 Given that $\tan \theta = p$, where p is a constant and $0^\circ < \theta < 90^\circ$.
Diberi $\tan \theta = p$, dengan keadaan p ialah pemalar dan $0^\circ < \theta < 90^\circ$.

Find in terms of p :
Cari dalam sebutan p :



(a) $\cos \theta$,
 $\text{kos } \theta$,

(b) $\sin 2\theta$
 $2 \sin \theta \cos \theta$

[3 marks]
[3 markah]

Answer / Jawapan : (a) $\cos \theta =$

(b) $\sin 2\theta =$

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12

3



13

Diagram 13 shows part of the graph of $\frac{1}{y}$ against x .

Rajah 13 menunjukkan sebahagian daripada graf $\frac{1}{y}$ melawan x .

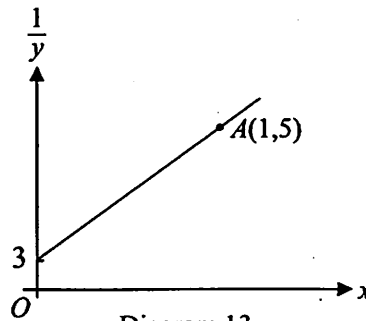


Diagram 13
Rajah 13

The variables x and y are related by the equation $\frac{x}{y} = -kx^2 + \frac{x}{h}$, where h and k are constants.

Pemboleh ubah x dan pemboleh ubah y dihubungkan oleh persamaan $\frac{x}{y} = -kx^2 + \frac{x}{h}$, dengan keadaan h dan k ialah pemalar.

Find the value of h and of k .

[4 marks]

Cari nilai h dan nilai k .

[4 markah]

13



Answer / Jawapan : $h = \dots\dots\dots$

$k = \dots\dots\dots$

- 14 Diagram 14 shows the straight line AC . A point $B(1, 1)$ lies on AC .

Rajah 14 menunjukkan garis lurus AC . Suatu titik $B(1, 1)$ terletak di atas AC .

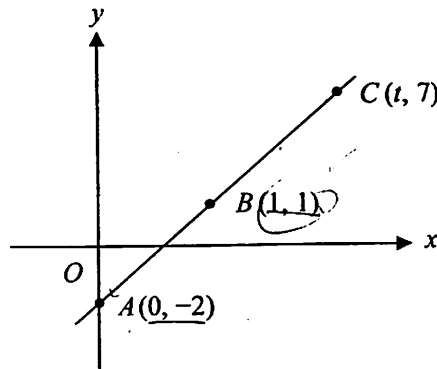


Diagram 14
Rajah 14

- (a) Find the value of t .
Cari nilai t .
- (b) A point $P(x, y)$ moves such that $PA = 3$. Find the equation of the locus of P .
Suatu titik $P(x, y)$ bergerak dengan keadaan $PA = 3$. Cari persamaan lokus bagi P .

[3 marks]
[3 markah]

$$\frac{1 - (-2)}{1} = 3$$

$$y - 1 = 3(x - 1)$$

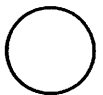
$$y = 3x - 2$$

Answer / Jawapan : (a) $t =$

(b)

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14
3



- 17 Diagram 17 shows a triangle JKL .
Rajah 17 menunjukkan sebuah segi tiga JKL .

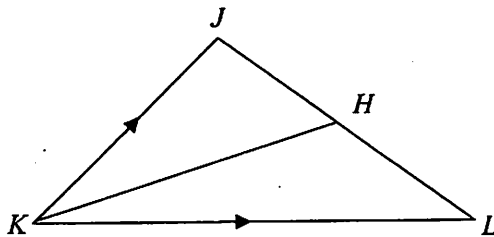


Diagram 17
Rajah 17

JHL is a straight line where $JL = 2JH$. Given $\overline{KL} = 8a$ and $\overline{KJ} = 6b$.

JHL ialah satu garis lurus dengan keadaan $JL = 2JH$. Diberi $\overline{KL} = 8a$ dan $\overline{KJ} = 6b$.

Express in terms of a and b ,

Ungkapkan dalam sebutan a dan b ,

(a) \overline{JL} ,

(b) \overline{KH} .

[3 marks]

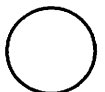
[3 markah]

Answer / Jawapan : (a)

(b) $m =$

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18

Diagram 18 shows a sector OPQ with centre O and radius of 8.6 cm.

Rajah 18 menunjukkan sebuah sektor OPQ berpusat O dan berjajari 8.6 cm.

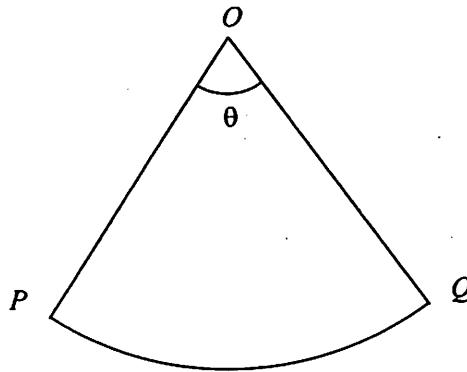


Diagram 18
Rajah 18

Given the area of the sector OPQ is 92.45 cm².

Diberi luas sektor OPQ ialah 92.45 cm².

Find
Cari

- (a) the value of θ , in radian,
nilai θ , dalam radian,

- (b) the length, in cm, of arc PQ .
panjang, dalam cm, lengkok PQ .

[4 marks]
[4 markah]

18



Answer / Jawapan : (a) $\theta = \dots\dots\dots$

(b) $\dots\dots\dots$ cm

- 19 The curve $y = 2ax^2 + bx$ has a turning point at (2, 3), where a and b are constants.
Find the value of a and of b . [3 marks]

Lengkung $y = 2ax^2 + bx$ mempunyai titik pusingan di (2, 3), dengan keadaan a dan b ialah pemalar.

Cari nilai a dan nilai b . [3 markah]

Answer / Jawapan : $a = \dots\dots\dots$

$b = \dots\dots\dots$

19

19
3

- 20 The equation of a curve $y = \frac{1}{p-x}$, $x \neq p$, where p is a constant, passes through $A(-2, 2)$.

Persamaan suatu lengkung $y = \frac{1}{p-x}$, $x \neq p$, dengan keadaan p ialah pemalar, melalui $A(-2, 2)$.

Find
Cari

- (a) the value of p ,
nilai p ,
- (b) the gradient of the tangent at the point A .
kecerunan tangen pada titik A .

[4 marks]
[4 markah]

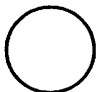
Answer / Jawapan : (a) $p = \dots\dots\dots$

(b) $\dots\dots\dots$

20

20
4

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21 Given that $\int_{-2}^k h(x) dx = 4$ and $\int_{-2}^k \left[\frac{h(x)}{2} - x \right] dx = k$, where k is a constant and $k > -2$.

Diberi $\int_{-2}^k h(x) dx = 4$ dan $\int_{-2}^k \left[\frac{h(x)}{2} - x \right] dx = k$, dengan keadaan k ialah pemalar dan $k > -2$.

Find
Cari

- (a) $\int_k^{-2} h(x) dx$,
(b) the value of k ,
nilai k .

$$k^2 + 2k + 8 = 0$$

$$\frac{1}{2} \int_{-2}^k h(x) dx - \int_{-2}^k x dx = k$$

$$2 - \left[\frac{x^2}{2} \right]_{-2}^k = k$$

$$2 - \left[\frac{k^2}{2} - 2 \right] = k$$

$$2 - \frac{k^2}{2} + 2 = k$$

$$0 = \frac{k^2}{2} + k - 4$$

[4 marks]
[4 markah]

Answer / Jawapan : (a)

(b) $k = 2$

21
4

22 A set of data consists of six numbers. The sum of the numbers is 70 and the sum of the squares of the numbers is 960. A number m is added to the data. The mean of seven numbers is 12.

Satu set data mengandungi enam nombor. Hasil tambah bagi nombor-nombor itu ialah 70 dan hasil tambah bagi kuasa dua nombor-nombor itu ialah 960. Satu nombor m ditambah kepada data ini. Min bagi tujuh nombor itu ialah 12.

Find
Cari

- (a) the value of m ,
nilai m ,
(b) the standard deviation for the seven numbers.
sisihan piawai bagi tujuh nombor itu.

[3 marks]
[3 markah]

22
3

Answer / Jawapan : (a) $m =$

(b)

- 23 A mathematics test consists of two sections. The number of questions in Section A is 5, whereas the number of questions in Section B is 4.

Satu ujian matematik mengandungi dua bahagian. Bilangan soalan dalam Bahagian A ialah 5, manakala bilangan soalan dalam Bahagian B ialah 4.

Find the number of ways a student can answer the questions in the test if the student must answer

Cari bilangan cara seorang murid boleh menjawab soalan-soalan ujian itu jika murid itu mesti menjawab

- (a) any 6 questions,
mana-mana 6 soalan,
- (b) 4 questions from Section A and 2 questions from Section B.
4 soalan daripada Bahagian A dan 2 soalan daripada Bahagian B.

[4 marks]

[4 markah]

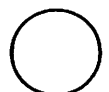
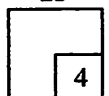
Answer / Jawapan : (a)

(b)

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23



Examiner's
Use

24

The probability of Siti and of Kumares travelling to London by Air Malaysia is $\frac{2}{3}$ and $\frac{1}{6}$ respectively.

Kebarangkalian Siti dan Kumares pergi ke London menaiki Penerbangan Air Malaysia masing-masing ialah $\frac{2}{3}$ dan $\frac{1}{6}$.

Find the probability that

Cari kebarangkalian bahawa

- (a) neither of them is travelling by Air Malaysia,
kedua-duanya tidak menaiki Penerbangan Air Malaysia,
- (b) only one of them travel by Air Malaysia.
hanya seorang daripada mereka menaiki Penerbangan Air Malaysia.

[4 marks]

[4 markah]

24



Answer / Jawapan : (a)

(b)

- 25 Diagram 25 shows a standard normal distribution graph.
Rajah 25 menunjukkan satu graf taburan normal piawai.

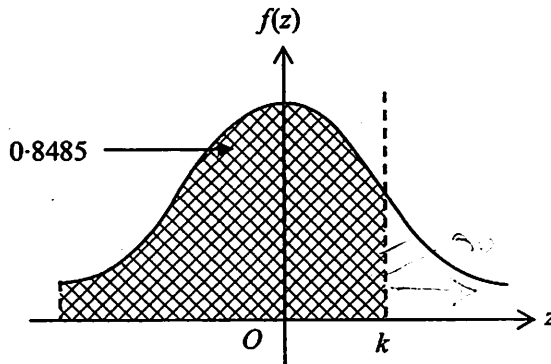


Diagram 25
Rajah 25

The probability represented by the area of the shaded region is 0.8485.
Kebarangkalian yang diwakili oleh luas kawasan berlorek ialah 0.8485.

- (a) Find the value of k .
Cari nilai k
- (b) The distances travelled in a certain day by the taxis owned by Berjaya Company is normally distributed. Find the total number of taxis owned by the company when 30 taxis travel with distances in z -score more than k .
Dalam satu hari tertentu, jarak perjalanan teksi-teksi milik Syarikat Berjaya bertabur secara normal. Cari jumlah teksi yang dimiliki oleh syarikat tersebut apabila jarak perjalanan 30 buah teksi dalam skor- z melebihi k .

[4 marks]
[4 markah]

Answer / Jawapan : (a) $k =$
(b)

25
4

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

