



NAMA :

TINGKATAN :

JABATAN PELAJARAN NEGERI TERENGGANU

PEPERIKSAAN AKHIR TAHUN 2010
TINGKATAN 4
ADDITIONAL MATHEMATICS

3472/1

Kertas 1
Okt/Nov 2010
2 jam

Untuk Kegunaan Pemeriksa

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

JANGAN BUKA KERTAS SOALAN INI
SEHINGGA DIBERITAHU

1. *Tulis Nama dan Tingkatan pada ruang 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 dalam bahasa Melayu.*
5. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

Disediakan Oleh:
AKRAM NEGERI TERENGGANU

Dibiayai Oleh:
KERAJAAN NEGERI TERENGGANU

TERENGGANU ANJUNG ILMU

Dicetak Oleh:
Percetakan Yayasan Islam Terengganu Sdn. Bhd.
Tel: 609-666 8611/6652/8601 Faks: 609-666 0611/0063

Kertas soalan ini mengandungi 22 halaman bercetak dan 2 halaman kosong.

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. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
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. $\log_a \frac{m}{n} = \log_a m - \log_a n$
7. $\log_a m^n = n \log_a m$
8. $\log_a b = \frac{\log_c b}{\log_c a}$

CALCULUS / KALKULUS

1. $y = uv$
 $\frac{dy}{dx} = u \frac{dv}{dx} + v \frac{du}{dx}$
2. $y = \frac{u}{v}$, $\frac{dy}{dx} = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$
3. $\frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$

STATISTICS / STATISTIK

1. $\bar{x} = \frac{\sum x}{N}$
2. $\bar{x} = \frac{\sum fx}{\sum f}$
3. $\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{N}} = \sqrt{\frac{\sum x^2}{N} - (\bar{x})^2}$
4. $\sigma = \sqrt{\frac{\sum f(x - \bar{x})^2}{\sum f}} = \sqrt{\frac{\sum fx^2}{\sum f} - (\bar{x})^2}$
5. $m = L + \left(\frac{\frac{1}{2}N - F}{f_m} \right) C$
6. $I = \frac{Q_1}{Q_0} \times 100$
7. $\bar{I} = \frac{\sum W_i I_i}{\sum W_i}$

GEOMETRI (GEOMETRY)

1. Distance /
- Jarak*

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

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*

$$\frac{1}{2} |(x_1y_2 + x_2y_3 + x_3y_1) - (x_2y_1 + x_3y_2 + x_1y_3)|$$

TRIGONOMETRY / TRIGONOMETRI

1. Arc length,
- $s = r\theta$

$$\text{Panjang lengkok, } s = j\theta$$

2. Area of sector =
- $\frac{1}{2} r^2\theta$

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

- 3.
- $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

- 4.
- $a^2 = b^2 + c^2 - 2bc \cos A$

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

5. Area of triangle /
- Luas segi tiga*

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

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HALAMAN KOSONG

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Answer all questions.

Jawab semua soalan.

1 Diagram 1 shows the relation between two sets.

Rajah 1 menunjukkan hubungan antara dua set.

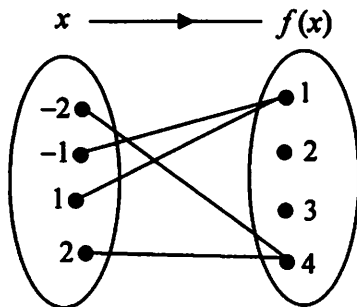


Diagram 1 / Rajah 1

State

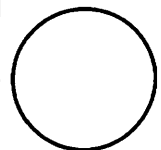
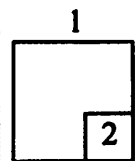
Nyatakan

- (a) the type of the relation,
jenis hubungan itu,
- (b) the range of the relation.
julat hubungan itu.

[2 marks]
[2 markah]

Answer / Jawapan : (a)

(b)



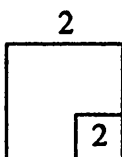
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2 Given that $f: x \rightarrow 5x + 2$, find $f^{-1}(-3)$.

[2 marks]

Diberi $f: x \rightarrow 5x + 2$, cari $f^{-1}(-3)$.

[2 markah]



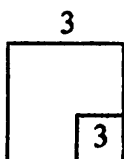
Answer / Jawapan :

3 Given that $f(x) = 7 - 2x$ and $g(x) = 3hx + k$ where h and k are constants.

If $fg(x) = 9 - 3x$, find the value of h and of k . [3 marks]

Diberi $f(x) = 7 - 2x$ dan $g(x) = 3hx + k$ dengan keadaan h dan k adalah pemalar.

Jika $fg(x) = 9 - 3x$, cari nilai h dan nilai k . [3 markah]



Answer / Jawapan : $h =$

$k =$

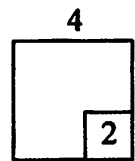
4 Form the quadratic equation which have the roots -2 and $\frac{2}{3}$. Give your answer in general form. [2 marks]

Bentukkan persamaan kuadratik yang mempunyai punca-punca -2 dan $\frac{2}{3}$.

Berikan jawapan anda dalam bentuk am. [2 markah]

Answer / Jawapan :

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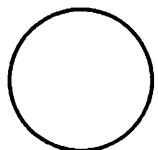
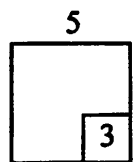


5 The quadratic equation $hx^2 + 9 = kx$, where h and k are constants, has two equal roots. Express h in terms of k . [3 marks]

Persamaan kuadratik $hx^2 + 9 = kx$, dengan keadaan h dan k ialah pemalar, mempunyai dua punca sama. Ungkapkan h dalam sebutan k .

[3 markah]

Answer / Jawapan :

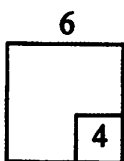


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- 6 The quadratic function $f(x) = px^2 + 8x + p - 6$ does not intersect the x -axis.
Find the range of values of p . [4 marks]

Fungsi kuadratik $f(x) = px^2 + 8x + p - 6$ tidak menyilang paksi- x .

Cari julat nilai p . [4 markah]

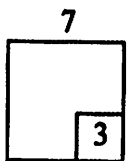


Answer / Jawapan :

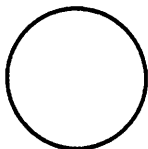
- 7 Find the range of values of x for which $3x^2 - 5x - 2 < 0$. [3 marks]

Cari julat nilai x bagi $3x^2 - 5x - 2 < 0$.

[3 markah]



Answer / Jawapan :



- 8 In Diagram 8, (m, n) is the turning point of the curve $y = 2(x + 2)^2 - 14$.
 Dalam Rajah 8, (m, n) adalah titik pusingan bagi lengkung $y = 2(x + 2)^2 - 14$.

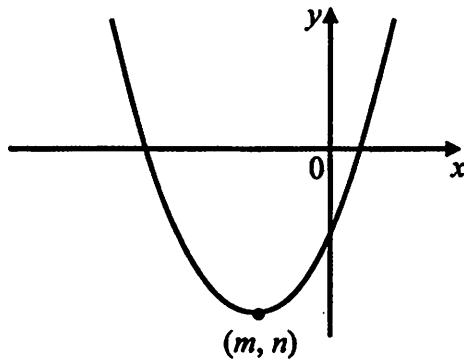


Diagram 8 / Rajah 8

- (a) Determine the value of m and n .
Tentukan nilai m dan nilai n .
- (b) State the equation of the axis of symmetry.
Nyatakan persamaan paksi simetri.

[3 marks]
 [3 markah]

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

$n = \dots\dots\dots$

(b) $\dots\dots\dots$

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- 9 Diagram 9 shows a straight line PQ where point P lies on the x -axis and point Q lies on the y -axis.

Rajah 9 menunjukkan garis lurus PQ dengan titik P berada pada paksi- x dan titik Q berada pada paksi- y .

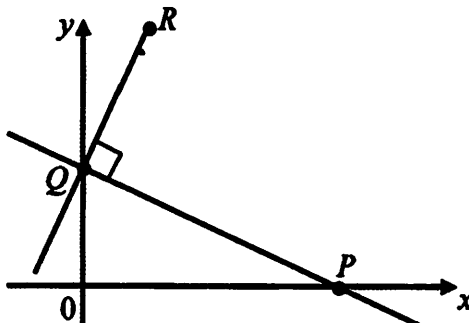
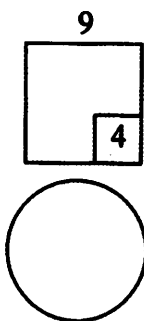


Diagram 9 / Rajah 9

Given the equation of the straight line PQ is $x + 2y = 12$, find the equation of the straight line QR .

Diberi persamaan garis lurus PQ adalah $x + 2y = 12$, cari persamaan garis lurus QR .
[4 marks]
[4 markah]



Answer / Jawapan :

10 Diagram 10 shows a sector POQ with centre O .
Rajah 10 menunjukkan sektor POQ dengan pusat O .

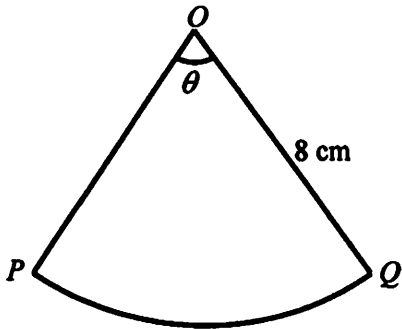


Diagram 10 / *Rajah 10*

Given the length of arc PQ is 12.5 cm and the radius of sector POQ is 8 cm.

Find the value of θ in radians.

Diberi panjang lengkok PQ ialah 12.5 cm dan jejari sektor POQ ialah 8 cm.

Cari nilai θ dalam radian.

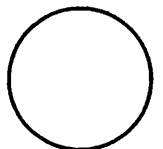
[2 marks]
 [2 markah]

Answer / *Jawapan* : $\theta = \dots\dots\dots$

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11 Diagram 11 shows a sector of a circle OPQ with centre O and OPR is a right-angled triangle.

Rajah 11 menunjukkan sektor bulatan OPQ berpusat O dan OPR ialah segitiga bersudut tegak.

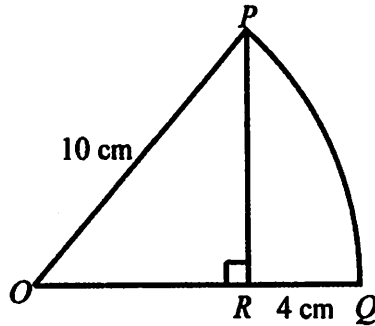


Diagram 11 / Rajah 11

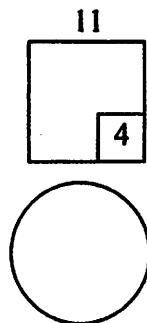
Find the area of the sector OPQ .

Cari luas sektor OPQ .

[Use / Guna $\pi = 3.142$]

[4 marks]

[4 markah]



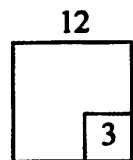
Answer / Jawapan :

- 12 The points $(-3, 0)$, $(5, p)$ and $(6, 3)$ are the vertices of a triangle. Given that the area of the triangle is $7\frac{1}{2}$ unit², find the possible values of p . [3 marks]

Titik-titik $(-3, 0)$, $(5, p)$ dan $(6, 3)$ adalah bucu sebuah segitiga. Diberi luas segitiga itu adalah $7\frac{1}{2}$ unit², cari nilai-nilai yang mungkin bagi p . [3 markah]

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

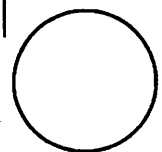
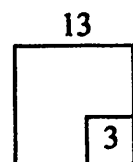


- 13 Given $P(-1, 2)$, $Q(2, -1)$ and $R(4, -3)$ are three points on a straight line such that $PQ : QR = m : n$. Find the value of m and of n . [3 marks]

Diberi $P(-1, 2)$, $Q(2, -1)$ dan $R(4, -3)$ adalah tiga titik pada suatu garis lurus dengan keadaan $PQ : QR = m : n$. Cari nilai m dan nilai n . [3 markah]

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

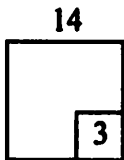
$n = \dots\dots\dots$



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14 Simplify $\frac{4 \times 2^{p-3}}{2^p \times 8^{p-1}}$. [3 marks]

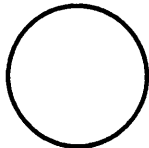
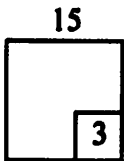
Ringkaskan $\frac{4 \times 2^{p-3}}{2^p \times 8^{p-1}}$. [3 markah]



Answer / Jawapan :

15 Solve the equation $4^x = 128$. [3 marks]

Selesaikan persamaan $4^x = 128$. [3 markah]



Answer / Jawapan :

16 Given that $3^k \times 9^{1-k} = \frac{1}{\sqrt{27^{k-2}}}$, find the value of k .

[3 marks]

For
examiner's
use

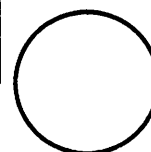
Diberi bahawa $3^k \times 9^{1-k} = \frac{1}{\sqrt{27^{k-2}}}$, cari nilai k .

[3 markah]

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

16

3



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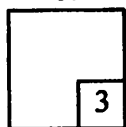
- 17 Given that $p^m = 2$ and $p^n = 3$, express $\log_p \left(\frac{9p}{8} \right)$ in terms of m and n .

[3 marks]

Diberi bahawa $p^m = 2$ dan $p^n = 3$, ungkapkan $\log_p \left(\frac{9p}{8} \right)$ dalam sebutan m dan n .

[3 markah]

17



Answer / Jawapan :

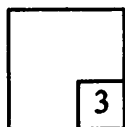
- 18 Solve the equation $\log_3 4m - \log_3 (2m - 1) = 1$.

[3 marks]

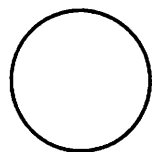
Selesaikan persamaan $\log_3 4m - \log_3 (2m - 1) = 1$.

[3 markah]

18



Answer / Jawapan :



19 Solve the equation $\log_9 3p + \log_3 p = -1$.

[4 marks]

Selesaikan persamaan $\log_9 3p + \log_3 p = -1$.

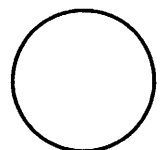
[4 markah]

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Answer / Jawapan :

19

4



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- 20 Table 20 shows the number of fish caught by a number of participants in a fishing competition.

Jadual 20 menunjukkan bilangan ikan yang ditangkap oleh sebilangan peserta pertandingan memancing.

Number of fish <i>Bilangan ikan</i>	1	2	3	4	5
Number of participants <i>Bilangan peserta</i>	9	8	m	10	3

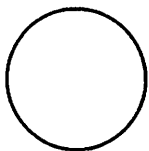
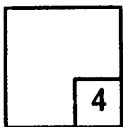
Table 20 / *Jadual 20*

- (a) If the mode is 4, determine the maximum value of m .
Jika mod ialah 4, tentukan nilai maksimum bagi m .
- (b) Calculate the mean number of fish caught if the number of participants are 35.
Hitungkan min bilangan ikan yang ditangkap jika bilangan peserta adalah 35 orang.

[4 marks]

[4 markah]

20



Answer / *Jawapan* : (a)

(b)

21 Given $g(x) = \frac{2x-1}{x+1}$, find $g'(x)$.

[3 marks]

*For
examiner's
use*

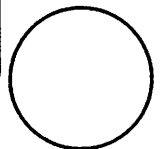
Diberi $g(x) = \frac{2x-1}{x+1}$, cari $g'(x)$.

[3 markah]

Answer / Jawapan :

21

3



For
examiner's
use

22 Given a set of data $\{x_1, x_2, x_3, x_4, x_5, x_6\}$ has a mean of 20 and a standard deviation of 8. If each data is multiplied by 2 and then added by 3, find

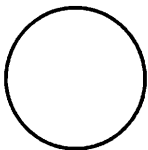
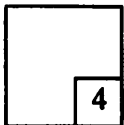
Diberi satu set data $\{x_1, x_2, x_3, x_4, x_5, x_6\}$ mempunyai min 20 dan sisihan piawai 8.

Jika setiap data didarab 2 dan kemudian ditambah 3, cari

- (a) the new mean,
min yang baru,
- (b) the new variance.
varians yang baru.

[4 marks]
[4 markah]

22



Answer / Jawapan : (a)
(b)

23 A set of 4 numbers $p - q$, $4 + q$, $3p - 2$ and 12 has mean of 7.5 and variance of 5.
Suatu set data 4 nombor $p - q$, $4 + q$, $3p - 2$ dan 12 mempunyai min 7.5 dan varians 5.

*For
examiner's
use*

Find / Cari

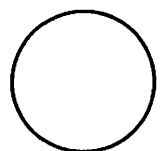
- (a) the value of p ,
nilai p ,
- (b) the value of Σx^2 .
nilai Σx^2 .

[4 marks]
[4 markah]

Answer / Jawapan : (a) $p = \dots\dots\dots$
(b) $\Sigma x^2 = \dots\dots\dots$

23

4



For
examiner's
use

24 Given that $y = \frac{4}{(5-2x)^3}$,

Diberi $y = \frac{4}{(5-2x)^3}$,

find / cari

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

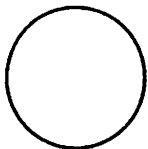
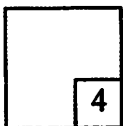
(b) the small change in y , when x changes from 2 to 2.02.

perubahan kecil bagi y , apabila x berubah daripada 2 kepada 2.02.

[4 marks]

[4 markah]

24



Answer / Jawapan : (a)

(b)

25 A closed cylinder has a constant height of 10 cm and the radius of its base, r cm varies as shown in Diagram 25.

Sebuah silinder tertutup mempunyai tinggi tetap 10 cm dan jejari tapaknya, r cm yang berubah-ubah seperti yang ditunjukkan dalam Rajah 25.

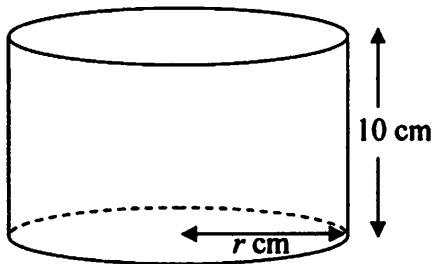


Diagram 25 / Rajah 25

Find the rate of increase of the volume of the cylinder, V cm³ when the radius of its base is increasing at the rate of 0.2 cms⁻¹, when the radius is 2 cm.

Cari kadar pertambahan isipadu silinder itu apabila jejari tapaknya bertambah dengan kadar 0.2 cms⁻¹, pada ketika jejaringnya ialah 2 cm.

[Volume of cylinder / Isipadu silinder = $\pi r^2 h$]

[4 marks]

[4 markah]

Answer / Jawapan :

END OF QUESTION PAPER

KERTAS SOALAN TAMAT

For
examiner's
use

25

4

