

SULIT
3472/1
Additional
Mathematics
Kertas 1
Okt 2008
2 jam



3472/1

JABATAN PELAJARAN NEGERI TERENGGANU

PEPERIKSAAN AKHIR TAHUN 2008
TINGKATAN 4

NAMA :

TINGKATAN :

**ADDITIONAL
MATHEMATICS**

Kertas 1
Dua jam

**DO NOT OPEN THIS QUESTION PAPER
UNTIL YOU ARE TOLD TO DO SO**

1. *This question paper consists of 25 questions.*
2. *Answer all questions.*
3. *Give only one answer for each question.*
4. *Write your answers in the spaces provided in this question paper.*
5. *Show your working. It may help you to get marks.*
6. *If you wish to change your answer, cross out the work that you have done. Then write down the new answer.*
7. *The diagrams in the questions provided are not drawn to scale unless stated.*
8. *The marks allocated for each question are shown in brackets.*
9. *You may use a non-programmable scientific calculator and a four-figure mathematical table.*
10. *This question paper must be handed in at the end of the examination.*

Untuk Kegunaan Pemeriksa

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

This question paper consists of 20 printed pages.

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. $(a^m)^n = a^{m \times n}$

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. $\frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$

4. Area under a curve

Luas di bawah lengkung

$$= \int_a^b y \, dx \text{ or / atau}$$

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

5. Volume generated

Isipadu janaan

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

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

 STATISTICS (STATISTIK)

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

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

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

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

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

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

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

 GEOMETRI (GEOMETRY)

1. Distance / Jarak

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

3. A point dividing a segment of a line

Titik yang membahagi suatu tembereng garis

$$(x, y) = \left(\frac{nx_1 + mx_2}{m+n}, \frac{ny_1 + my_2}{m+n} \right)$$

2. Midpoint / Titik tengah

$$(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

4. Area of triangle / Luas segi tiga

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

TRIGONOMETRY (TRIGONOMETRI)

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

Panjang lengkok, $s = j\theta$

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

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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use only

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

- 1 Diagram 1 shows the relation between set *P* and set *Q*.
Rajah 1 menunjukkan hubungan antara set *P* dan set *Q*.

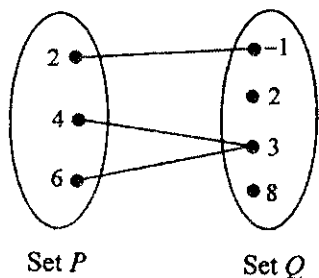


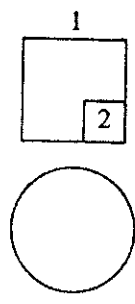
Diagram 1 / Rajah 1

State
Nyatakan

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

[2 marks]
[2 markah]

Answer / Jawapan : (a)
(b)



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- 2 The function g is defined by $g(x) = 3 - 2x$. Find the object when the image is 11. [2 marks]

Fungsi g ditakrifkan oleh $g(x) = 3 - 2x$. Cari nilai objek apabila imejnya ialah 11. [2 markah]

Answer / Jawapan :

- 3 Given that the quadratic equation $x^2 + (p - 1)x + 9 = 0$ has equal real roots, find the possible values of p . [3 marks]

Diberi persamaan kuadratik $x^2 + (p - 1)x + 9 = 0$ mempunyai punca sama yang nyata, cari nilai-nilai yang mungkin bagi p . [3 markah]

Answer / Jawapan : $p =$

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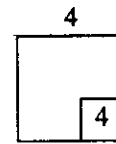


- 4 Given that $f: x \rightarrow 3x - 1$ and $g: x \rightarrow x^2 - 7x + 10$, find
 Diberi bahawa $f: x \rightarrow 3x - 1$ dan $g: x \rightarrow x^2 - 7x + 10$, cari
- (a) f^{-1} ,
 - (b) $gf^{-1}(5)$.

[4 marks]
[4 markah]

Answer / Jawapan : (a)
(b)

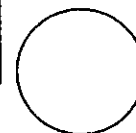
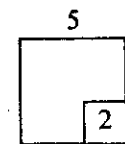
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- 5 Form a quadratic equation which has roots $x = -3$ and $x = \frac{1}{4}$. Give your answer in the form $ax^2 + bx + c = 0$, where a, b and c are constants. [2 marks]

Bentukkan persamaan kuadratik yang mempunyai punca $x = -3$ dan $x = \frac{1}{4}$.
 Beri jawapan anda dalam bentuk $ax^2 + bx + c = 0$, dengan keadaan a, b dan c adalah pemalar. [2 markah]

Answer / Jawapan :



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6 Solve the quadratic inequality $x(x - 2) < 15$.

[3 marks]

Sesaikan ketaksamaan kuadratik $x(x - 2) < 15$.

[3 markah]

Answer / Jawapan :

7 The quadratic equation $x(x + 2) = mx - 9$ has two distinct roots.
Find the range of values of m .

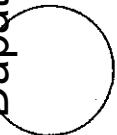
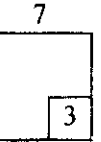
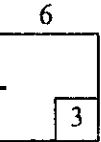
[3 marks]

*Persamaan kuadratik $x(x + 2) = mx - 9$ mempunyai dua punca berbeza.
Cari julat nilai m .*

[3 markah]

Answer / Jawapan :

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8 Given that α and β are the roots of the quadratic equation $3x^2 + 6x + 2 = 0$.
 Form a quadratic equation which has the roots 2α and 2β .

[4 marks]

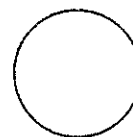
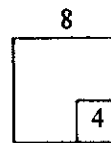
Diberi α dan β adalah punca-punca persamaan kuadratik $3x^2 + 6x + 2 = 0$.

Bentukkan persamaan kuadratik yang mempunyai punca-punca 2α dan 2β .

[4 markah]

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Answer / Jawapan :



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9 In Diagram 2, the point (5, 1) is the minimum point of the curve $(x - 5)^2 + q$, where p and q are constants.

Dalam Rajah 2, titik (5, 1) ialah titik minimum bagi lengkung $(x - 5)^2 + q$, dengan keadaan p dan q adalah pemalar.

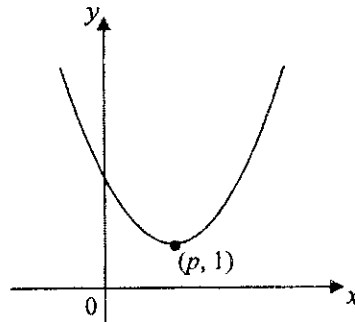


Diagram 2 / Rajah 2

Find

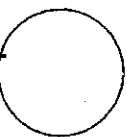
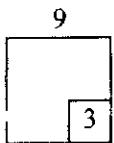
Cari

- (a) the value of p and of q ,
nilai p dan nilai q ,
- (b) the equation of the axis of symmetry.
persamaan paksi simetri.

[3 marks]

[3 markah]

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

(b) $\dots\dots\dots$

10 Given that the points $A(4, -1)$, $B(1, 3)$, $C(-4, 2)$ and $D(p, q)$ are four vertices of a rhombus $ABCD$. Find the value of p and of q . [3 marks]

Diberi titik-titik $A(4, -1)$, $B(1, 3)$, $C(-4, 2)$ dan $D(p, q)$ adalah empat bucu sebuah rombus $ABCD$. Cari nilai p dan nilai q . [3 markah]

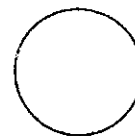
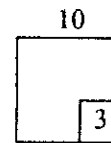
Answer / Jawapan : p
 q

11 The vertices of a triangle are $P(3, k)$, $Q(-1, 3)$ and $R(-3, -1)$. Given that the area of the triangle is 10 unit^2 , find the values of k . [3 marks]

Bucu-bucu sebuah segi tiga ialah $P(3, k)$, $Q(-1, 3)$ dan $R(-3, -1)$. Diberi luas segi tiga itu ialah 10 unit^2 , cari nilai-nilai k . [3 markah]

Answer / Jawapan : $k =$

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- 12 Diagram 3 shows a sector OAB of a circle with centre O .
Rajah 3 menunjukkan sektor OAB sebuah bulatan berpusat O .

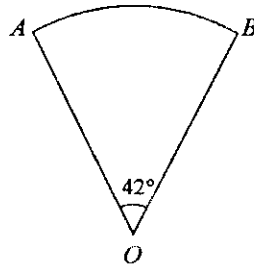


Diagram 3 / *Rajah 3*

Given the radius of the circle is 8 cm, calculate the area of the sector.

Diberi jejari bulatan ialah 8 cm, hitungkan luas sektor itu.

[Use / *Guna* $\pi = 3.142$]

[3 marks]

[3 markah]

Answer / *Jawapan* :

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2
3

13 In Diagram 4, OAD and OBC are two sectors of a circle with centre O .
 Dalam Rajah 4, OAD dan OBC adalah dua sektor bulatan berpusat O .

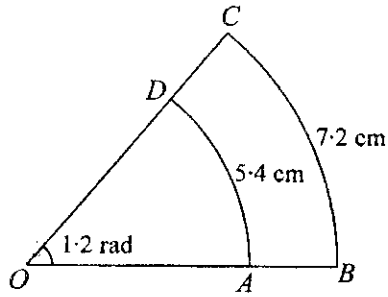


Diagram 4 / Rajah 4

Find
Cari

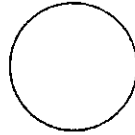
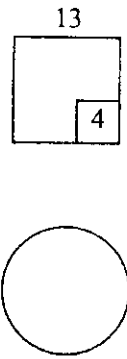
- (a) the length of OA ,
panjang OA ,
- (b) the perimeter of $ABCD$.
perimeter bagi $ABCD$.

[4 marks]
[4 markah]

Answer / Jawapan : (a) $OA = \dots\dots\dots$
 (b) $\dots\dots\dots$

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- 14 Diagram 5 shows a sector OPQ with centre O .
Rajah 5 menunjukkan sektor OPQ berpusat O .

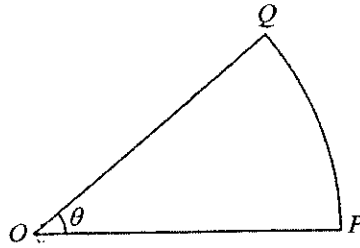


Diagram 5 / Rajah 5

Given that the length of the arc PQ is 12 cm and the perimeter of the sector OPQ is 30 cm. Find the value of θ in radian. [3 marks]

Diberi bahawa panjang lengkok PQ ialah 12 cm dan perimeter sektor OPQ ialah 30 cm. Cari nilai θ dalam radian. [3 markah]

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14
3

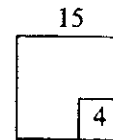
Answer / Jawapan : $\theta = \dots\dots\dots$

15 $K(0, 1)$ and $L(6, 2)$ are two fixed points. A point P moves such that $PK : PL = 1 : 2$. Find the equation of the locus of point P . [4 marks]

$K(0, 1)$ dan $L(6, 2)$ adalah dua titik tetap. Satu titik P bergerak supaya $PK : PL = 1 : 2$. Carikan persamaan lokus bagi titik P . [4 markah]

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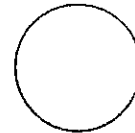
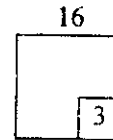
Answer / Jawapan :



16 Solve the equation $4^{x+2} = \frac{1}{8^{x-4}}$. [3 marks]

Selesaikan persamaan $4^{x+2} = \frac{1}{8^{x-4}}$. [3 markah]

Answer / Jawapan :



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17 Given that $\log_2 p + \log_2 4 = 3$, find the value of p .

[3 marks]

Diberi bahawa $\log_2 p + \log_2 4 = 3$, cari nilai p .

[3 markah]

17

3

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

18 Simplify the expression $9^n \times 3^{2n+1} \div 27^{\frac{n}{3}-1}$.

[4 marks]

Ringkaskan ungkapan $9^n \times 3^{2n+1} \div 27^{\frac{n}{3}-1}$.

[4 markah]

18

4

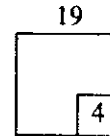
Answer / Jawapan : $\dots\dots\dots$

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- 19 Given that $\log_2 y - \log_4 x = 1$, express x in terms of y . [4 marks]
 Diberi bahawa $\log_2 y - \log_4 x = 1$, ungkapkan x dalam sebutan y . [4 markah]

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Answer / Jawapan :

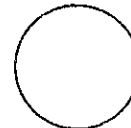
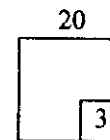


- 20 Set M consists of 10 numbers which has a mean of 16. When the number y is added to the set, the mean increased by 2. Find the value of y . [3 marks]

Set M mengandungi 10 nombor mempunyai min 16. Apabila suatu nombor y ditambah kepada set itu, nilai min bertambah sebanyak 2, cari nilai bagi y .

[3 markah]

Answer / Jawapan : $y =$



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21 Given that $f(x) = 3x^2 + 11x - 4$, find the value of $f'(2)$.

[2 marks]

Diberi bahawa $f(x) = 3x^2 + 11x - 4$, cari nilai $f'(2)$.

[2 markah]

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21

2

Answer / Jawapan :

22 Differentiate $3x(2x - 1)^5$ with respect to x .

[3 marks]

Bezakan $3x(2x - 1)^5$ terhadap x .

[3 markah]

22

3

Answer / Jawapan :

Age (in years) <i>Umur (dalam tahun)</i>	1 – 15	16 – 30	31 – 45	46 – 60
No. of residents <i>Bilangan penduduk</i>	28	52	14	6

Table 1 / *Jadual 1*

23 Table 1 shows the distribution of age of 100 residents in a particular housing area. Without drawing the ogive, find the median age.

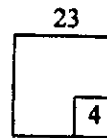
[4 marks]

Jadual 1 menunjukkan taburan umur 100 penduduk di suatu taman perumahan. Tanpa melukis ogif, carikan umur median.

[4 markah]

Answer / *Jawapan* :

4, 3, 7, 2, 2, 6



24 Based on the information above, calculate
Berdasarkan maklumat di atas, hitungkan

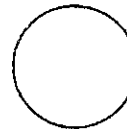
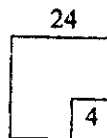
- (a) the mean,
min,
- (b) the standard deviation.
sisihan piawai.

[4 marks]

[4 markah]

Answer / *Jawapan* : (a)

(b)



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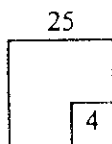
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25 Given that $y = 2x^2 + 5$,

- (a) calculate the small change in y when x increases from 3 cm to 3.01 cm.
hitung perubahan kecil bagi y apabila x menokok dari 3 cm kepada 3.01 cm.
- (b) Hence, find the value of y after the small change in x .
Seterusnya, cari nilai y selepas berlaku perubahan kecil pada x .

[4 marks]
[4 markah]

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Answer / Jawapan : (a)
(b)

END OF QUESTION PAPER

KERTAS SOALAN TAMAT