

3472/1
Additional
Mathematics
Oktober
2007
2 hrs

JABATAN PELAJARAN TERENGGANU
DENGAN KERJASAMA
PERSIDANGAN KEBANGSAAN PENGETUA
SEKOLAH MENENGAH MALAYSIA
CAWANGAN TERENGGANU

PEPERIKSAAN AKHIR TAHUN 2007
TINGKATAN 4

NAMA :

**ADDITIONAL
MATHEMATICS**

Paper 1

Two hours

TINGKATAN :

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

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

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

Kertas soalan ini mengandungi 15 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

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

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

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

$$4. (a^m)^n = a^{m \cdot n}$$

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

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

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

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

STATISTIK (STATISTICS)

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

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

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

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

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

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

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

GEOMETRI (GEOMETRY)

1. Jarak (Distance)

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

$$(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$
3. Titik yang membahagi suatu tembereng garis
 (A point dividing a segment of a line)

$$(x, y) = \left(\frac{nx_1 + mx_2}{m+n}, \frac{ny_1 + my_2}{m+n} \right)$$
4. Luas segi tiga (Area of triangle) =

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

TRIGONOMETRI (TRIGONOMETRY)

1. Panjang lengkok, $s = j\theta$
 Arc length, $s = r\theta$
2. Luas sektor, $L = \frac{1}{2} j^2\theta$
 Area of sector = $\frac{1}{2} r^2\theta$
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. Luas segi tiga (Area of triangle)

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

KALKULUS (CALCULUS)

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

Answer all questions.

Jawab semua soalan.

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pemeriksa

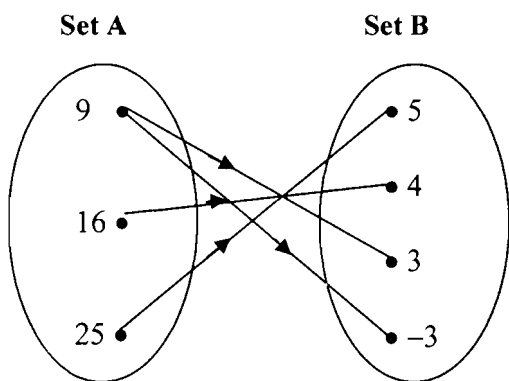


Diagram 1

1 Diagram 1 shows the relation between set A and set B.

State

(a) the type of relation

(b) the relation by using function notation

[2 marks]

Rajah 1 menunjukkan hubungan antara set A dan set B.

Nyatakan

(a) jenis hubungan itu,

(b) hubungan itu menggunakan tatatanda fungsi

[2 markah]

Answer : (a)

(b)

2 Given that $f : x \rightarrow k - 3x$, where k is a constant and $f(-k) = -8$, find the value of k .

[2 marks]

Diber $f : x \rightarrow k - 3x$, dimana k adalah pemalar dan $f(-k) = -8$, cari nilai k .

[2 markah]

Answer :

$$f: x \rightarrow 3 - 2x$$

$$h: x \rightarrow 4x - 5$$

- 3 The following information refers to the functions f and h . Find $hf^{-1}(x)$.

[4 marks]

Maklumat berikut adalah berkaitan dengan fungsi f and h . Carikan $hf^{-1}(x)$.

[4 markah]

Answer :

- 4 Solve the quadratic equation $3x(x - 2) = (x - 1)(x + 3)$.

Give your answer correct to four significant figures.

[3 marks]

Selesaikan persamaan kuadratik $3x(x - 2) = (x - 1)(x + 3)$.

Tuliskan jawapan anda betul kepada empat angka bererti.

[3 markah]

Answer :

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

Bentukkan persamaan kuadrat yang mempunyai punca-punca 2 and $-\frac{1}{3}$.

Beri jawapan anda dalam bentuk $ax^2 + bx + c = 0$, dengan keadaan a , b dan c adalah pemalar. [3 markah]

Answer:

- 6 A quadratic equation $4x^2 + kx = 5x - 9$ has two equal roots.
Find the possible values of k . [4 marks]

Suatu persamaan kuadrat $4x^2 + kx = 5x - 9$ mempunyai dua punca sama.

Cari nilai-nilai k yang mungkin. [4 markah]

Answer:

- 7 Find the range of the values of x for which $x^2 - 4x - 12 > 0$. [3 marks]

Cari julat nilai x bagi $x^2 - 4x - 12 > 0$. [3 markah]

Answer:

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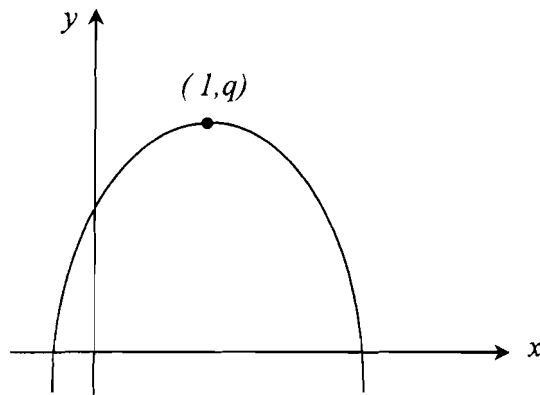


Diagram 2

8 Diagram 2 shows the graph of a quadratic functions $f(x) = 5 - 2(x + p)^2$ with the maximum point $(1, q)$, where p and q is a constant.

State

- (a) the value of p
- (b) the value of q
- (c) the equation of the axis of symmetry

[3 marks]

Rajah 2 menunjukkan graf fungsi kuadratik $f(x) = 5 - 2(x + p)^2$ mempunyai titik maksimum $(1, q)$, di mana p dan q adalah pemalar.

Nyatakan

- (a) nilai p
- (b) nilai q
- (c) persamaan paksi simetri

[3 markah]

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

(b) $q = \dots\dots\dots$

(c) $\dots\dots\dots$

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pemeriksa

- 9 Express $2x^2 - 12x + 11$ in the form $a(x - p)^2 + q$ [3 marks]

Ungkapkan $2x^2 - 12x + 11$ dalam bentuk $a(x - p)^2 + q$ [3 markah]

Answer:

- 10 Solve the equation $81^{2-x} = 3^{4x}$. [3 marks]

Selesaikan persamaan $81^{2-x} = 3^{4x}$. [3 markah]

Answer:

- 11 Solve the equation $2 + \log_2(3x - 1) = \log_2 4x$. [3 marks]

Selesaikan persamaan $2 + \log_2(3x - 1) = \log_2 4x$. [3 markah]

Answer:

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12 Given that $\log_a 3 = p$ and $\log_a 5 = q$, express $\log_a \left(\frac{25a}{9}\right)$ in term of p and q .

[4 marks]

Diberi $\log_a 3 = p$ dan $\log_a 5 = q$, ungkapkan $\log_a \left(\frac{25a}{9}\right)$ dalam sebutan p and q .

[4 markah]

Answer :

13 Find the equation of perpendicular bisector of points $(2 , - 6)$ and $(4 , 2)$. [4 marks]

Carikan persamaan pembahagi dua sama seranjang garis yang menyambung titik $(2 , - 6)$ dan $(4 , 2)$.

[4 markah]

Answer:

- 14 The point M is (1 , -3) and the point N is (6 , 4). The point P moves such that $PM : PN = 1 : 2$. Find the equation of the locus of P.

[3 marks]

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pemeriksa

Titik M ialah (1 , -3) dan titik N ialah (6 , 4). Titik P bergerak dengan keadaan $PM : PN = 1 : 2$. Carikan persamaan lokus bagi P.

[3 markah]

Answer:

$$CD : y = (k + 2)x + 7$$

$$XY : y = 5 - 3kx + 4x$$

- 15 The following information refers to the equations of two straight lines, CD and XY, which are parallel to each other. Find the value of k .

[3 marks]

Maklumat berikut adalah berkaitan dengan persamaan dua garis lurus, CD dan XY, yang selari antara satu sama lain. Carikan nilai k .

[3 markah]

Answer :

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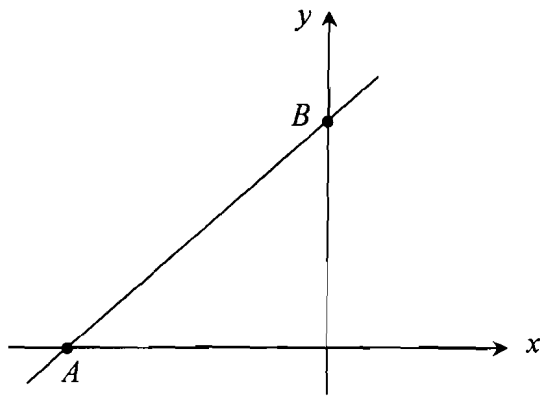


Diagram 3

16 Diagram 3 shows a straight line AB with the equation $3y = 4x + 12$. The point A lies on the x-axis and the point B lies on the y-axis. Find the equation of the straight line perpendicular to AB and passing through the point B.

[3 marks]

Rajah 3 menunjukkan garis lurus AB yang mempunyai persamaan $3y = 4x + 12$. Titik A terletak pada paksi-x dan titik B terletak pada paksi-y. Carikan persamaan garis lurus yang berserenjang dengan AB dan melalui titik B

[3 markah]

Answer :

[4 markah]

- 17 Given the set of data 8 , 11, 16, 21, 6, 9, 10, 21, 15. Determine
- (a) the interquartile range of the data
 - (b) the range of the data
 - (c) the mean of the data

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pemeriksa*

[3 marks]

Diberi satu set data 8 , 11, 16, 21, 6, 9, 10, 21, 15. Tentukan

- (a) julat antara kuartil
- (b) julat data
- (c) min data

[3 markah]

Answer (a).....

(b).....

(c).....

- 18 A set of integers consists of 2, 5 and 11. Find variance for this set of integers.

[3 marks]

Satu set integer terdiri daripada 2, 5 and 11. Carikan nilai varians bagi set integer ini.

[3 markah]

Answer :

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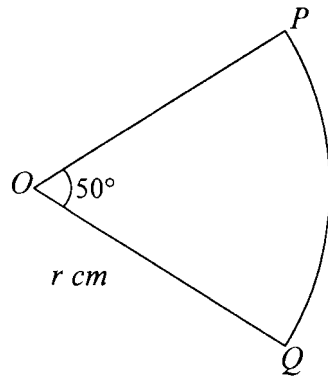


Diagram 4

- 19 Diagram 4 shows a sector POQ with centre O. The perimeter of the sector POQ is 20.11 cm. Find the value of r .

[3 marks]

Rajah 4 menunjukkan sector POQ berpusat O. Perimeter sector POQ is 20.11 cm.

Carikan nilai r .

[3 markah]

Answer :

- 20 Given sector AOB of radius 5 cm has an arc AB, length 12 cm. Calculate the area of the sector AOB.

[4 marks]

Diberi sektor bulatan AOB berjari 5 cm dengan panjang lengkok 12 cm. Hitungkan luas bagi sektor AOB.

[4 markah]

Answer :

21 (a) Differentiate $4x - 3x^5 + 6$ with respect to x .

(b) Given that $g(x) = 3(2 - 4x)^5$, find $g'(x)$

[2 marks]

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(a) Bezakan $4x - 3x^5 + 6$ terhadap x .

(b) Diberi $g(x) = 3(2 - 4x)^5$, carikan $g'(x)$

[2 markah]

Answer: (a)

(b)

22 It is given that $y = \frac{2}{5}u^6$, where $u = 7 - 5x$. Find $\frac{dy}{dx}$ in terms of x .

[4 marks]

Diberi bahawa $y = \frac{2}{5}u^6$, dengan keadaan $u = 7 - 5x$. Cari $\frac{dy}{dx}$ dalam sebutan x .

[4 markah]

Answer :

23 Find $\frac{d}{dx} \left(\frac{3x}{4 - 2x} \right)$.

[3 marks]

Carikan $\frac{d}{dx} \left(\frac{3x}{4 - 2x} \right)$.

[3 markah]

Answer :

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pemeriksa

24 Evaluate

(a) $\lim_{x \rightarrow 2} \left(\frac{2}{4 - x} \right)$

(b) $\lim_{x \rightarrow 3} \left(\frac{x^2 - 9}{x - 3} \right)$

[3 marks]

Nilaikan

(a) $\lim_{x \rightarrow 2} \left(\frac{2}{4 - x} \right)$

(b) $\lim_{x \rightarrow 3} \left(\frac{x^2 - 9}{x - 3} \right)$

[3 markah]

Answer: (a)

(b)

25 Find the equation of the tangent to the curve $y = 2x^2 - x + 1$ at the point (1 , 2).

[3 marks]

Carikan persamaan tangent kepada lengkung $y = 2x^2 - x + 1$ pada titik (1 , 2).

[3 markah]

Answer :

END OF QUESTION PAPER