

SULIT
3472/1
Additional
Mathematics
Kertas 1
2008
2 jam



Nama

Tingkatan:

JABATAN PELAJARAN MELAKA
UJIAN PENGESANAN PERTENGAHAN TAHUN
SIJIL PELAJARAN MALAYSIA 2008

ADDITIONAL MATHEMATICS

Kertas 1
 Dua Jam

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Tulis **nama** dan **tingkatan** anda pada ruang yang disediakan.
2. Kertas soalan ini mengandungi 25 soalan dan adalah dalam dwibahasa.
3. Jawab **semua** soalan. Bagi setiap soalan berikan **SATU** jawapan sahaja.
4. Jawapan hendaklah ditulis pada ruang yang disediakan dalam kertas soalan.
5. Tunjukkan langkah-langkah penting dalam kerja mengira anda. Ini boleh membantu anda untuk mendapatkan markah.
6. Sekiranya anda hendak menukar jawapan, batalkan kerja mengira yang telah dibuat. Kemudian tulis jawapan yang baru.
7. Rajah yang mengiringi soalan ini tidak dilukiskan mengikut skala kecuali dinyatakan.
8. Markah yang diperuntukkan bagi setiap soalan atau ceraian soalan ditunjukkan dalam kurungan.
9. Satu senarai rumus disediakan di halaman 3 hingga 5
10. Buku sifir matematik empat angka boleh digunakan.
11. Penggunaan kalkulator saintifik yang tidak boleh diprogramkan adalah dibenarkan
12. Kertas soalan ini hendaklah diserahkan pada akhir peperiksaan .

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

Kertas soalan ini mengandungi 17 halaman bercetak.

INFORMATION FOR CANDIDATES

1. *This question paper consists of 25 questions.*
2. *Answer **all** questions .*
3. *Give only **one** answer for each question.*
4. *Write your answers clearly in the spaces provided in the 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. *A list of formulae is provided on pages 3 to 5.*
10. *A booklet of four-figure mathematical tables is provided..*
11. *You may use a non-programmable scientific calculator.*
12. *This question paper must be handed in at the end of the examination.*

The following formulae may be helpful in answering the questions. The symbols given are the ones commonly used.

Rumus-rumus berikut boleh digunakan untuk membantu anda menjawab soalan. Simbol-simbol yang diberi adalah yang biasa digunakan.

ALGEBRA

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

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

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

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

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

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

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

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

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

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

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

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

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

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)

$$= \int_a^b y \, dx \quad \text{atau} \quad = \int_a^b x \, dy$$

5 Volume generated
(Isipadu janaan)

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

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. $\bar{I} = \frac{\sum w_1 I_1}{\sum w_1}$
8. ${}^n P_r = \frac{n!}{(n-r)!}$
9. ${}^n C_r = \frac{n!}{(n-r)!r!}$
10. $P(A \cup B) = P(A) + P(B) - P(A \cap B)$
11. $P(X=r) = {}^n C_r p^r q^{n-r}$, $p + q = 1$
12. Mean (Min) = np
13. $\sigma = \sqrt{npq}$
14. $z = \frac{x - \mu}{\sigma}$

GEOMETRY (GEOMETRI)

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 segitiga)
 $= \frac{1}{2} |(x_1 y_2 + x_2 y_3 + x_3 y_1) - (x_2 y_1 + x_3 y_2 + x_1 y_3)|$
5. $|r| = \sqrt{x^2 + y^2}$
6. $r = \frac{xi + yj}{\sqrt{x^2 + y^2}}$

(TRIGONOMETRY) TRIGONOMETRI

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

Panjang lengkok, $s = j\theta$

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

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

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

$\sin^2 A + \text{kos}^2 A = 1$

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

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

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

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

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

$\sin 2A = 2 \sin A \text{kos} A$

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

$= 2 \cos^2 A - 1$

$= 1 - 2 \sin^2 A$

$\text{kos} 2A = \text{kos}^2 A - \sin^2 A$

$= 2 \text{kos}^2 A - 1$

$= 1 - 2 \sin^2 A$

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

$\sin(A \pm B) = \sin A \text{kos} B \pm \text{kos} A \sin B$

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

$\text{kos}(A \pm B) = \text{kos} A \text{kos} B \mp \sin A \sin B$

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

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

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

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

$a^2 = b^2 + c^2 - 2bc \text{kos} A$

14. Area of triangle (Luas segitiga)

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

1. Given that set $P = \{2, 3, 5\}$ and set $Q = \{5, 6, 8, 12, 15\}$. Set P and set Q is denoted by the ordered pairs $\{(2,6), (3,8), (5,12)\}$.

State the

(a) object of 8

(b) image for 5

[2 marks]

Diberi set $P = \{2, 3, 5\}$ dan set $Q = \{5, 6, 8, 12, 15\}$. Set P dikaitkan dengan set Q oleh satu hubungan dan ditakrifkan oleh set pasangan tertib $\{(2,6), (3,8), (5,12)\}$.

Nyatakan

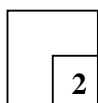
(a) objek bagi 8

(b) imej bagi 5

Answer : (a)

(b)

1



2. In Diagram 1, function f^{-1} maps n onto 7 . Given that function $f: x \rightarrow \frac{3x-5}{4}$, find the value of n .

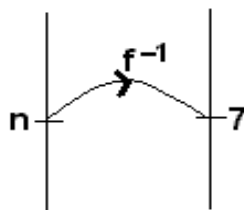


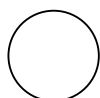
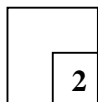
Diagram 1

[2 marks]

Dalam Rajah 1, fungsi f^{-1} memetakan n kepada 7 . Diberi fungsi $f: x \rightarrow \frac{3x-5}{4}$, carikan nilai n .

Answer : $n = \dots\dots\dots$

2



3. Given that $f: x \rightarrow 3 - 2x$ and $g :x \rightarrow 1 - 5x^2$, find

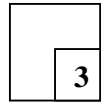
- (a) f^{-1}
- (b) the value of $gf^{-1}(1)$

[3 marks]

Diberi fungsi $f: x \rightarrow 3 - 2x$ dan $g :x \rightarrow 1 - 5x^2$. Cari

- (a) f^{-1}
- (b) nilai $gf^{-1}(1)$

3



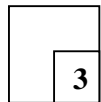
Answer : (a).....

(b).....

4. Solve the quadratic equation $2x(3x - 4) = x + 1$. Give your answer correct to three decimal places. [3 marks]

Selesaikan persamaan kuadrat $2x(3x - 4) = x + 1$. Berikan jawapan anda betul kepada tiga tempat perpuluhan.

4

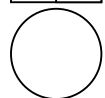
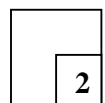


Answer :

5. Given that the quadratic equation $(p + 1)x^2 + 3x + 4 = 0$ has two equal roots, Find the value of p . [2 marks]

Diberi persamaan kuadrat $(p + 1)x^2 + 3x + 4 = 0$ mempunyai dua punca yang sama, carikan nilai p .

5



Answer :.....

6. Diagram 2 shows graph of quadratic function $f(x)=16 - (x - p)^2$, with p as a constant.

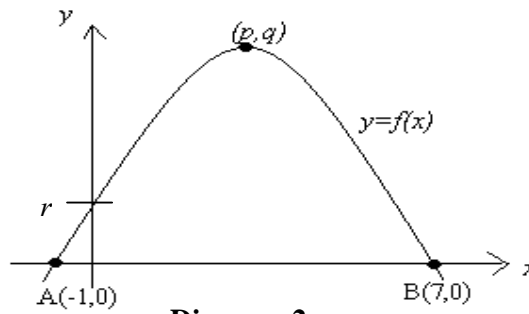


Diagram 2

The curve $y=f(x)$ has maximum point (p, q) , such that q is a constant.

State

- (a) value of p ,
- (b) value of q ,
- (c) value of r

[3 marks]

Rajah 2 menunjukkan graf fungsi kuadratik $f(x)=16 - (x - p)^2$, dengan keadaan p ialah pemalar. Lengkung $y=f(x)$ mempunyai titik maksimum (p, q) , dengan keadaan q ialah pemalar

Nyatakan

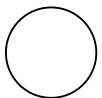
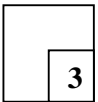
- (a) nilai p ,
- (b) nilai q ,
- (c) nilai r

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

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

(c) $r = \dots\dots\dots$

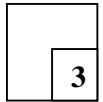
6



7. Find the range of values of x for quadratic inequalities $\frac{3}{2} > 2x(x-1)$. [3 marks]

Carikan julat nilai x bagi ketaksamaan kuadratik $\frac{3}{2} > 2x(x-1)$

7

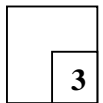


Answer :

8. Solve $16(4^{x-1}) = 2^{3x-2}$ [3 marks]

Selesaikan persamaan $16(4^{x-1}) = 2^{3x-2}$

8

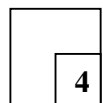


Answer:

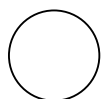
9. Solve the equation $\log_2 y^2 = 4 + \log_2 (y-4)$. [4 marks]

Selesaikan persamaan $\log_2 y^2 = 4 + \log_2 (y-4)$.

9



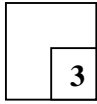
Answer:



10. Evaluate $\frac{1}{\log_a 27} \left[\log_a \frac{5}{9} - 2 \log_a \frac{3}{7} + \log_a \frac{27}{245} \right]$. [3 marks]

Nilaikan $\frac{1}{\log_a 27} \left[\log_a \frac{5}{9} - 2 \log_a \frac{3}{7} + \log_a \frac{27}{245} \right]$

10

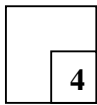


Answer:

11. Numbers $m + 2$, $n - 1$, 11 are the first three terms in an arithmetic progression. If the total of these numbers is 24, find the value of m and value of n . [4 marks]

Nombor $m + 2$, $n - 1$, 11 adalah tiga sebutan pertama dalam suatu jangjang aritmetik. Jika jumlah tiga nombor itu ialah 24, carikan nilai m dan n .

11



Answer : (a) $m = \dots \dots \dots n = \dots \dots \dots$

12. For a geometric progression with common ratio, r , such that $r > 1$. The second term is 12 and the third term exceeds the first term by 32. Find [4 marks]
- (a) the common ratio of the progression,
- (b) the fourth term.

Bagi suatu jangjang geometri dengan nisbah sepunya, r , dengan keadaan $r > 1$. Sebutan kedua ialah 12 dan sebutan ketiga melebihi sebutan pertama sebanyak 32. Carikan

- (a) nisbah sepunya jangjang itu,
- (b) sebutan keempat.

12



Answer :(a)

(b)

13.

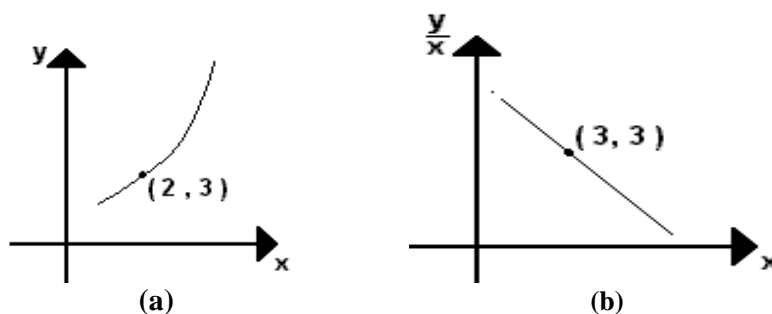


Diagram 3

Diagram 3(a) shows a part of curve $y = hx^2 + kx$ and Diagram 3(b) shows the graph of straight line $\frac{y}{x}$ against x where h and k are constants. Find the values of h and k .

[4 marks]

Rajah 3(a) menunjukkan sebahagian daripada lengkung $y = hx^2 + kx$ dan

Rajah 3(b) menunjukkan graf garis lurus $\frac{y}{x}$ melawan x dengan h dan k adalah pemalar.

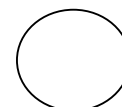
Carikan nilai h dan k

13



Answer: $h = \dots\dots\dots$

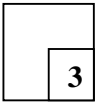
$k = \dots\dots\dots$



14. Straight line $ax + by = 12$ passes the points $(0,4)$ and $(\frac{3}{2}, 2)$. Determine the value of a and b . [3 marks]

Garis lurus $ax + by = 12$ melalui titik-titik $(0,4)$ dan $(\frac{3}{2}, 2)$. Tentukan nilai a dan nilai b .

14

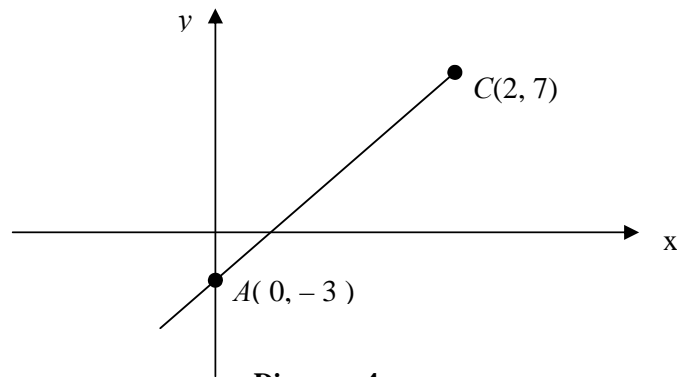


Answer : a =

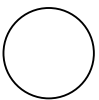
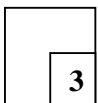
b =

15. Diagram 4 shows a straight line AC . Find the equation of the straight line which passes through point C and perpendicular to AC . [3 marks]

Rajah 1 menunjukkan garis lurus AC . Carikan persamaan garis lurus yang melalui titik C dan berserenjang dengan garis lurus AC .



15



Answer:

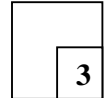
16. Determine the value of k if $(2, 6)$, $(2k, 3k + 1)$ and $(6, 8)$ are collinear.

[3 marks]

Tentukan nilai k jika $(2, 6)$, $(2k, 3k + 1)$ dan $(6, 8)$ adalah segaris.

Answer : $k = \dots\dots\dots$

16



17. Diagram 5 shows a parallelogram $ABCD$.

Rajah 5 menunjukkan sebuah segiempat selari $ABCD$

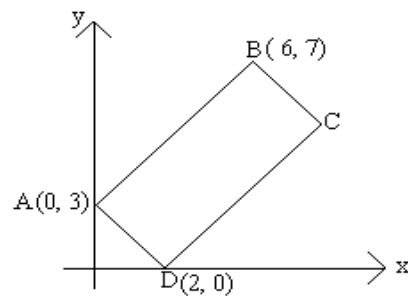


Diagram 5

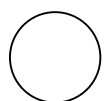
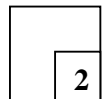
Determine the coordinates of C .

Tentukan koordinat bagi titik C .

[2 marks]

Answer: $C = (\dots\dots, \dots\dots)$

17



18. Given that $y = 4x^3 - 7x^2$,

(a) find $\frac{dy}{dx}$ at point (2, 4),

(b) hence, find the approximate increment in x when y increases from 4 to 4.05

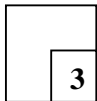
[3 marks]

Diberi $y = 4x^3 - 7x^2$,

(a) carikan $\frac{dy}{dx}$ pada titik (2, 4),

(b) Seterusnya, carikan pertambahan hampir dalam x apabila y bertambah dari 4 ke 4.05

18



Answer: (a)

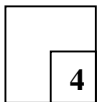
(b)

19. Given that $g(x) = \frac{3x-4}{x}$, $x \neq 0$, evaluate $g''(4)$.

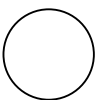
[4 marks]

Diberi bahawa $g(x) = \frac{3x-4}{x}$, $x \neq 0$, nilaikan $g''(4)$.

19



Answer :



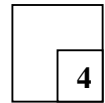
20. If $\int_1^2 g(x)dx = -8$ and $\int_1^2 (kx^3 - \frac{1}{2}g(x))dx = 12$. Find the value of k .

[4 marks]

. Diberi $\int_1^2 g(x)dx = -8$ dan $\int_1^2 (kx^3 - \frac{1}{2}g(x))dx = 12$. Carikan nilai k .

Answer :

20

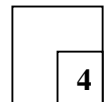


21. Find the equation of the curve which passes through point $(2, -6)$ and has gradient function $\frac{dy}{dx} = x^2(x-3)$. [4 marks]

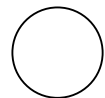
Carikan persamaan lengkung yang melalui titik $(2, -6)$ dan mempunyai fungsi kecerunan

$$\frac{dy}{dx} = x^2(x-3).$$

21



Answer :

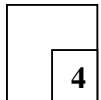


22. A wire with the length of 35 cm is bend to form a sector with radius 10 cm.
Find the area of the sector formed.

[4 marks]

Seutas dawai yang panjangnya 35 cm dibengkokkan untuk membentuk sebuah sector yang berjari 10 cm. Cari luas sector yang terbentuk itu.

22



Answer:

23. A circle of radius 2.5 cm has a minor sector with an area of 6.25 cm^2 . Calculate
(a) the angle of the sector in radians,
(b) the perimeter of the major sector.

[use $\pi = 3.142$]

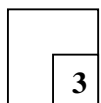
[3 marks]

Satu bulatan berjari 2.5 cm mempunyai sektor minor dengan luas 6.25 cm^2 . Kira

- (a) sudut sector tersebut dalam radian,
(b) perimeter sektor major .

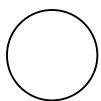
[use $\pi = 3.142$]

23



Answer : (a).....

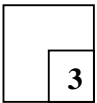
(b).....



24. Given that the mode and mean for a set of numbers $11, x, 16, 20, y, y, 35$ are 30 and 22 respectively. Determine the values of x and y . [3 marks]

Diberi mod dan min bagi bagi suatu set nombor $11, x, 16, 20, y, y, 35$ adalah 30 and 22 masing - masing . Tentukan nilai-nilai x dan y

24



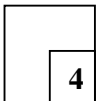
Answer : $x = \dots\dots\dots$

$y = \dots\dots\dots$

25. The variance of the numbers $3, x, 8, 8$ is 4.25. Find the possible values of x . [4 marks]

Diberi varians bagi data $3, x, 8, 8$ ialah 4.25. Cari nilai-nilai yang mungkin bagi x .

25



Answer :.....



END OF QUESTION PAPER