Nama: …… **Kelas: ……**

SULIT
3472/1
Matematik Tambahan
Kertas 1
September 2005

2 jam

3472/1

MAKTAB RENDAH SAINS MARA

PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2005

MATEMATIK TAMBAHAN

Kertas 1

Dua jam

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Tuliskan nama dan kelas anda pada ruang yang disediakan.*
2. *Kertas soalan ini adalah dalam dwibahasa.*
3. *Soalan di halaman kiri adalah dalam bahasa Melayu. Soalan di halaman kanan adalah yang sepadan dalam bahasa Inggeris*
4. *Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Melayu atau bahasa Inggeris.*
5. *Calon dikehendaki membaca arahan di halaman 2 dan halaman 3.*

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

3 4 7 2 1

Kertas soalan ini mengandungi 25 halaman bercetak dan 3 halaman tidak bercetak

[Lihat sebelah

Answer **all** *question*

For Examiner's Use

1 Given that $f(x) = 3x + 5$ and $g(x) = 2 - x$, find $gf^{-1}(x)$.

[2 *marks*]

Answer : .....

2

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2 Given the functions $h: x \to \frac{20}{2x-3}$, $x \neq \frac{3}{2}$, and $h(a) = a$, find the value of a.

[3 *marks*]

Answer : a = ...

3

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3 The equation $3x^2 + px + 12 = 0$ which has the roots 2 and q.
Find the values of p and of q.

[3 *marks*]

Answer : .....

3

For Examiner's Use

4 The equation $5x^2 + 30x + 9m = 0$ which has the roots are equal.
Find the value of m.

[2 *marks*]

Answer : .....

2

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5 Calculate the range of values of x for $5x - 3 < (x - 1)(x + 5)$.

[3 *marks*]

Answer : .....

3

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6 Solve the equation $8^{4x} \cdot 27^{2x} = 12$.

[3 *marks*]

Answer : .....

3

For Examiner's Use

7 Given that $2 \lg(x^2y) = 3 + \lg x - \lg y$, express y in terms of x.

[4 *marks*]

Answer: .....

4

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8 Given that $\log_2 x = p$, find $\log_x 16x^3$ in terms of p.

[3 *marks*]

Answer : .....

3

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9 The sum of the first n terms of a certain progression is $S_n = n^2 + \frac{3}{2}n$.

Calculate the eighth term of this progression.

[3 *marks*]

Answer : .....

3

For Examiner's Use

10 In a Geometric Progression, all terms are positive. Given that the sum of the first two terms is 5 and the sum to infinity is 9.

Calculate the values of the common ratio and the first term.

[4 *marks*]

Answer : .....

4

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11 The variables x and y are related by the equation $x^2y = px^2 - q$, where p and q are constants. A straight line is obtained by plotting y against $\frac{1}{x^2}$.

Given that the line passing through the points (4,0) and (2,6), find the values of *p* and of *q*.

[3 *marks*]

Answer : .....

3

For Examiner's Use

12 Diagram 1 shows a straight line $y = 2x + 3$ intercepting the line $x = k$ and y-axis at point A and point B respectively.

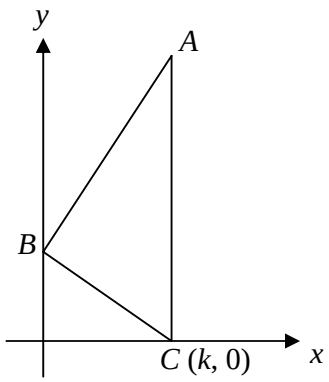

DIAGRAM 1

Given $\angle$ ABC = 90°, calculate the values of k.

[3 *marks*]

Answer : .....

3

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13 Given that $P(-1, -3)$, $Q(3, 3)$ and $R(-2, t)$ are the vertices of the triangle which has an area of 15 unit^2. Calculate the possible values of t.

[4 *marks*]

Answer : t = ...

4

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14 Given that $\underline{x} = 12i - 9j$ and $\underline{y} = 4\underline{i}$, find $|\underline{x} - \underline{y}|$

[2 *marks*]

Answer : .....

2

For Examiner's Use

15 Vectors a and b are non-parallel and non-zero. Given that $\underline{\boldsymbol{m}} = \underline{\boldsymbol{a}} + p(\underline{\boldsymbol{a}} + 2\underline{\boldsymbol{b}})$ and $\underline{\boldsymbol{n}} = 2\underline{\boldsymbol{a}} + \underline{\boldsymbol{b}} + q\underline{\boldsymbol{a}}$ where p and q are constants. If $\underline{\boldsymbol{m}}$ and $\underline{\boldsymbol{n}}$ are parallel, **e**xpress p in terms of q.

[4 *marks*]

Answer : .....

4

16 Diagram 2 shows a right angled triangle OPQ and a sector of the circle SOT and PQS, centers O and Q respectively.

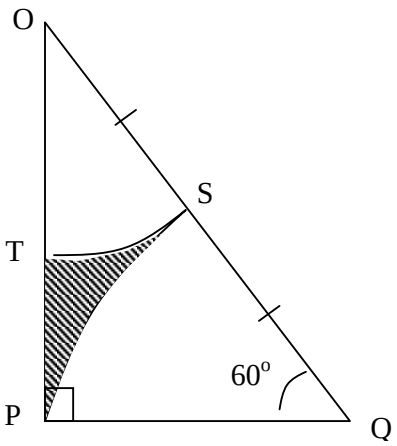

DIAGRAM 2

Given that OS = SQ and the perimeter of the shaded region is 21 cm, calculate the radii of each sector.

[4 *marks*]

Answer : .....

4

For Examiner's Use

17 Solve the equation $5 \sin x \cos x - 2 = 0$, for $0° < x < 180°$

[3 *marks*]

Answer : .....

3

18 The equation of the curve is $2y + \sin 2x = 0$. Sketch the graph of the curve for $0 < x < 2\pi$ on the axes provided below.

[3 *marks*]

Answer :

3

19 Find the coordinates of the turning point of the curve $y = x + \frac{1}{x}$.

[3 *marks*]

Answer : .....

3

For Examiner's Use

20 Given that $y=\frac{8}{x^5}$. The small change, u, causes an increase in x from 2 to 2 + u. Estimate the approximate value of $\frac{8}{(2+u)^5}$, in terms of u.

[4 *marks*]

Answer : .....

4

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21 Given $\frac{d}{dx}\left(\frac{x^2+1}{2x-3}\right) = f(x)$, find the values of $\int_0^1 \left(f(x)+x\right)dx$

[4 *marks*]

Answer : .....

4

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22 5 boy students and 4 girl students are to form a line. Find how many ways this can be done if;

(a) the girl students must sit together,
(b) no two boy students sit next to each other.

[4 *marks*]

Answer (a) : .....

(b) : .....

4

For Examiner's Use

23 There are 2 red cards and 6 green cards in a container. Two cards are randomly selected from the container.
Calculate the probability of choosing two cards of different color.

[2 *marks*]

Answer : .....

2

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24 Given that z is the score for the standard normal distribution.
If $P(k < z < 2.12) = 0.6384$, find the values of k.

[4 *marks*]

Answer : .....

4

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25 It is known that 2% of the number of pens produced from a factory are defect.
For samples of 5000 pens, calculate

(a) the mean,
(b) the standard deviation

for the number of pens are defects.

[3 *marks*]

Answer : .....

3

End of Question Paper