NAMA:..... NO. ANGKA GILIRAN:.....

3472/1
Additional
Mathematics
Paper 1
Sept.
2008
2 hours

PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA
NEGERI PERAK
2008

ADDITIONAL MATHEMATICS

Paper 1

Two hours

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Tuliskan* **nama** *dan* **nombor kad pengenalan** *anda pada ruangan yang disediakan.*

2. *Kertas soalan ini adalah dalam dwibahasa.*

3. *Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Malaysia.*

4. *Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Inggeris atau bahasa Malaysia.*

5. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

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

Kertas soalan ini mengandungi 20 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. $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

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. $\log_a \dfrac{m}{n} = \log_a m - \log_a n$

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

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

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

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

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

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

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

CALCULUS / *KALKULUS*

1. $y = uv, \dfrac{dy}{dx} = u\dfrac{dv}{dx} + v\dfrac{du}{dx}$

2. $y = \dfrac{u}{v}, \dfrac{dy}{dx} = \dfrac{v\dfrac{du}{dx} - u\dfrac{dv}{dx}}{v^2}$

3. $\dfrac{dy}{dx} = \dfrac{dy}{du} \times \dfrac{du}{dx}$

4. Area under a curve
Luas di bawah lengkung
$= \int_a^b y\, dx$ or *(atau)*
$= \int_a^b x\, dy$

5. Volume generated
Isipadu janaan
$= \int_a^b \pi y^2\, dx$ or *(atau)*
$= \int_a^b \pi x^2\, dy$

STATISTICS / *STATISTIK*

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

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

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

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

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

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

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

8. ${}^nP_r = \dfrac{n!}{(n-r)!}$

9. ${}^nC_r = \dfrac{n!}{(n-r)!r!}$

10. $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

11. $P(X = r) = {}^nC_r p^r q^{n-r}, p + q = 1$

12. Mean / *Min* , $\mu = np$

13. $\sigma = \sqrt{npq}$

14. $Z = \dfrac{X - \mu}{\sigma}$

GEOMETRY / *GEOMETRI*

1. Distance / *Jarak*

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

2. Midpoint / *Titik tengah*

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

3. A point dividing a segment of a line
Titik yang membahagi suatu tembereng garis

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

4. Area of a triangle / *Luas segitiga*

$= \dfrac{1}{2} \left| (x_1y_2 + x_2y_3 + x_3y_1) - (x_2y_1 + x_3y_2 + x_1y_3) \right|$

5. $|\underline{r}| = \sqrt{x^2 + y^2}$

6. $\hat{r} = \dfrac{x\underline{i} + y\underline{j}}{\sqrt{x^2 + y^2}}$

TRIGONOMETRY / *TRIGONOMETRI*

1. Arc length, $s = r\theta$
   Panjang lengkuk, $s = j\theta$

2. Area of sector, $L = \frac{1}{2}r^2\theta$
   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 a triangle / *Luas segitiga*
    $= \frac{1}{2}ab\sin C$

For Examiner's Use

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

1

$M = \{3, 5, 7\}$

$N = \{5, 7, 8, 10, 13\}$

Based on the relation defined by the ordered pairs (3, 5), (3, 8), (5, 7) and (5, 13), state
Berdasarkan hubungan yang ditakrif oleh pasangan bertertib (3, 5), (3, 8), (5, 7) *dan* (5, 13), *nyatakan*

(*a*) the object of 7,
objek bagi 7,

[2 *marks*]

(*b*) the range of the relation.
julat hubungan itu.

[2 *markah*]

Answer / *Jawapan* : (a) .....

(b) .....

2

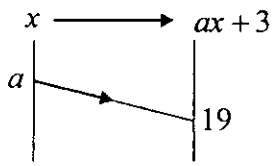

Diagram 1
Rajah 1

Diagram 1, shows part of the mapping $f : x \to ax + 3$.
Rajah 1, *menunjukkan sebahagian daripada pemetaan* $f : x \to ax + 3$.

Find the values of *a*.

[2 *marks*]

Cari nilai-nilai bagi a.

[2 *markah*]

Answer / *Jawapan* : a = ...

For Examiner's Use

3 The quadratic equation $kx^2 + 3 = kx + 5$ has two distinct roots.
Find the range of values of k.

[3 *marks*]

Persamaan kuadratik $kx^2 + 3 = kx + 5$ *mempunyai dua punca yang berbeza.*
Cari julat nilai k.

[3 *markah*]

Answer / *Jawapan* : .....

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4 The quadratic function $f(x) = x^2 + 7x + b$ has a minimum value of $\frac{1}{4}$.

Find the value of b.

[3 *marks*]

Fungsi kuadratik $f(x) = x^2 + 7x + b$ *mempunyai nilai minimum* $\frac{1}{4}$.

Cari nilai bagi b.

[3 *markah*]

Answer / *Jawapan* : b = ...

For Examiner's Use

5 Find the range of values of x for which $5+7x-6x^2 \geq 0$.

[3 *marks*]

Cari julat nilai x bagi $5+7x-6x^2 \geq 0$.

[3 *markah*]

Answer / *Jawapan* : .....

6 Simplify $2^{n+3}-2^{n+2}-2^n$ in the form $k(2^n)$, where k is a constant.

[3 *marks*]

Permudahkan $2^{n+3}-2^{n+2}-2^n$ *ke dalam bentuk* $k(2^n)$, *di mana k adalah pemalar.*

[3 *markah*]

Answer / *Jawapan* : .....

7 Find the value of w if $\log_{2w} 64 = 3$.

[3 *marks*]

Cari nilai w jika $\log_{2w} 64 = 3$.

[3 *markah*]

Answer / *Jawapan* : w = ...

8 Given that $\log_3 2A = \log_9 B + 2$, express A in terms of B.

[4 *marks*]

Diberi $\log_3 2A = \log_9 B + 2$, *nyatakan* A *dalam sebutan* B.

[4 *markah*]

For Examiner's Use

Answer / *Jawapan* : .....

9 Given that $P(5, -1)$, $Q(5, 4)$ and $R(r, 7)$, find the possible values of r if $PQ = \frac{1}{2}PR$.

[3 *marks*]

Diberi $P(5, -1)$, $Q(5, 4)$ *dan* $R(r, 7)$, *carikan nilai-nilai yang mungkin bagi* r *jika* $PQ = \frac{1}{2}PR$.

[3 *markah*]

Answer / *Jawapan* : r = ...

For Examiner's Use

10 Table 1 shows the distribution of scores obtained by 11 students in a Mathematics quiz.
Jadual 1 *menunjukkan taburan markah yang diperolehi oleh* 11 *orang pelajar semasa kuiz Matematik.*

Score / *Skor*	2	3	m	7	k	9
Number of Students / *Bil. Pelajar*	2	1	2	3	1	2

Table 1
Jadual 1

The scores are arranged in ascending order. The mean score is 6 and the third quartile is 8. Find the value of m and k.

[3 *marks*]

Markah skor telah disusun secara menaik. Skor min ialah 6 *dan kuartil ketiga ialah* 8. *Cari nilai bagi m dan k.*

[3 *markah*]

Answer / *Jawapan* : k .....

m .....

11 Differentiate $\frac{2x+1}{2x-1}$ with respect to x.

[3 *marks*]

Bezakan $\frac{2x+1}{2x-1}$ *terhadap* x.

[3 *markah*]

Answer / *Jawapan* : .....

12

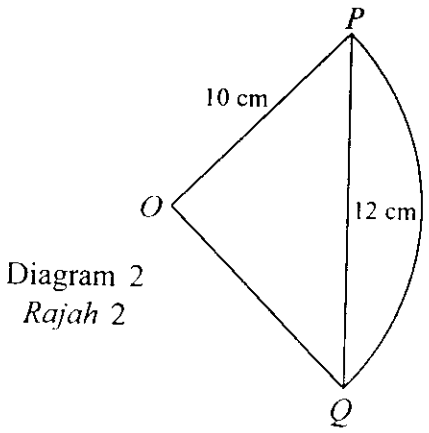

Diagram 2
Rajah 2

Diagram 2 shows a sector of a circle with centre O and radius 10 cm. Given PQ = 12 cm, find the length of arc PQ.

[3 *marks*]

Rajah 2 menunjukkan sektor sebuah bulatan berpusatkan O dengan jejari 10 cm. *Diberi* PQ = 12 cm, *cari panjang lengkuk* PQ.

[3 *markah*]

For Examiner's Use

Answer / *Jawapan* : .....

13 Given that $y = x^2 - 4x$, use differentiation method to find the small change in y when x increases from 4 to 4.02.

[3 *marks*]

Diberi $y = x^2 - 4x$, *gunakan kaedah pembezaan untuk mencari perubahan kecil bagi y apabila x menokok daripada* 4 *kepada* 4.02.

[3 *markah*]

Answer / *Jawapan* : .....

For Examiner's Use

14 The first three terms of an arithmetic progression are m, $2m + 5$ and $5m + 2$.
Find
Tiga sebutan pertama suatu janjang aritmetik ialah m, $2m + 5$ *dan* $5m + 2$.
Carikan

(a) the value of m,
nilai m,

(b) the sum of the first 10 terms of the progression.
hasil tambah 10 *sebutan pertama bagi janjang itu.*

[3 *marks*]
[3 *markah*]

Answer / *Jawapan* : *(a)* $m =$ .....

(b) .....

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15 In a geometric progression, the second term is 72 and the fourth term is 8.
Calculate
Dalam suatu janjang geometri, sebutan kedua ialah 72 *dan sebutan keempat ialah* 8. *Hitungkan*

(*a*) the positive value of the common ratio,
nilai positif bagi nisbah sepunya,

(*b*) the sum to infinity of the geometric progression.
hasil tambah sehingga ketakterhinggaan janjang geometri itu.

[4 *marks*]
[4 *markah*]

Answer / *Jawapan* : *(a)* .....

(b) .....

16

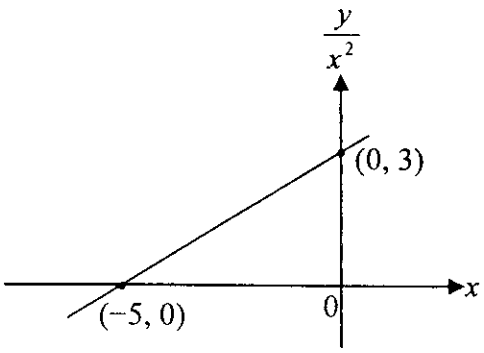

Diagram 3
Rajah 3

Diagram 3 shows the graph of straight line obtained by plotting $\frac{y}{x^2}$ against x.
Find

Rajah 3 menunjukkan graf garis lurus yang diperolehi dengan memplotkan $\frac{y}{x^2}$ *melawan* x. *Carikan*

(*a*) y in terms of x,
y dalam sebutan x ,

(*b*) value of y when $x = 1$.
nilai bagi y apabila x = 1.

[3 *marks*]
[3 *markah*]

For Examiner's Use

Answer / *Jawapan* : (*a*) .....

(*b*) .....

For Examiner's Use

17 Find the value of $\int_{-3}^{2} \frac{x^2 - 9}{x - 3} dx$.

[3 *marks*]

Cari nilai bagi $\int_{-3}^{2} \frac{x^2 - 9}{x - 3} dx$.

[3 *markah*]

Answer / *Jawapan* : .....

18 Diagram 4 shows the curve $y^2 = 2x$ and the straight line $y = k$.

Rajah 4 *menunjukkan lengkung* $y^2 = 2x$ *dan garis lurus* $y = k$.

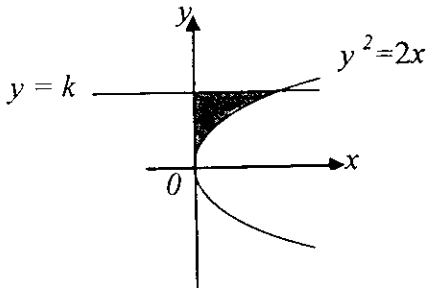

Diagram 4
Rajah 4

If the area of the shaded region is $\frac{9}{2}$ unit ^{2}, find the value of k.

Jika luas kawasan berlorek ialah $\frac{9}{2}$ *unit* ^{2}, *carikan nilai* k.

[4 *marks*]
[4 *markah*]

Answer / *Jawapan* : k = ...

19 $\mathbf{a} = 3\mathbf{p} + 4\mathbf{q}$
$\mathbf{b} = 2\mathbf{p} - \mathbf{q}$
$\mathbf{c} = m\mathbf{p} + (m - n)\mathbf{q}$, where m and n are constant.
di mana m dan n adalah pemalar.

For Examiner's Use

Use the above information to find the values of m and n when $\mathbf{c} = 4\mathbf{a} - 2\mathbf{b}$.
Gunakan maklumat di atas untuk mencari nilai m dan nilai n apabila $\mathbf{c} = 4\mathbf{a} - 2\mathbf{b}$.

[3 *marks*]
[3 *markah*]

Answer / *Jawapan* : .....

20 Given that $O(0, 0)$, $P(-2, 6)$ and $R(5, 7)$, find in terms of the unit vectors, $\underline{i}$ and $\underline{j}$.
Diberi $O(0, 0)$, $P(-2, 6)$ *dan* $R(5, 7)$, *carikan dalam sebutan vektor unit* $\underline{i}$ and $\underline{j}$.

(*a*) $\overrightarrow{PR}$,

(*b*) the unit vector in the direction of $\overrightarrow{PR}$.
vektor unit dalam $\overrightarrow{PR}$.

[4 *marks*]
[4 *markah*]

Answer / *Jawapan* : (*a*) .....

(*b*) .....

For Examiner's Use

21 Solve the equation $\sin\theta\cos\theta = \frac{\sqrt{3}}{4}$ for $0° \le \theta \le 360°$.

[3 *marks*]

Selesaikan persamaan $\sin\theta \, kos \, \theta = \frac{\sqrt{3}}{4}$ *untuk* $0° \le \theta \le 360°$.

[3 *markah*]

Answer / *Jawapan* : .....

22 (*a*) Find the number of four digit numbers less than 4000 that can be formed from digits 0, 1, 3, 4, 6 and 7 without repetition.

[2 *marks*]

Cari bilangan nombor empat digit yang kurang daripada 4000 *yang dapat dibentuk daripada digit-digit* 0, 1, 3, 4, 6 *dan* 7 *tanpa ulangan.*

[2 *markah*]

(*b*) Among these numbers how many are odd numbers?

[2 *marks*]

Di antara nombor-nombor itu, berapakah bilangan nombor ganjil?

[2 *markah*]

Answer / *Jawapan* : (*a*) .....

(*b*) .....

23 Anita, Goh and Laila will be taking part in a shooting competition. The probability that Anita, Goh and Laila will win the the competition is $\frac{3}{5}$, $\frac{3}{4}$ and $\frac{1}{3}$ respectively. Find the probability that

Anita, Goh dan Laila akan mengambil bahagian dalam satu pertandingan menembak. Kebarangkalian Anita, Goh dan Laila akan menang dalam pertandingan itu masing-masing ialah $\frac{3}{5}$, $\frac{3}{4}$ *dan* $\frac{1}{3}$ *. Tentukan kebarangkalian bahawa*

For Examiner's Use

(*a*) only Laila will lose in the competition,

[1 *mark*]

hanya Laila sahaja akan kalah dalam pertandingan itu,

[1 *markah*]

(*b*) only two of them will win the competition.

[2 *marks*]

hanya dua orang sahaja akan menang dalam pertandingan itu.

[2 *markah*]

Answer / *Jawapan* : (*a*) .....

(*b*) .....

For Examiner's Use

24 From a survey it is found that 60% of the students of SMK Kampung Gajah go to the school by bus. If a sample of 7 students is selected randomly from the school, find the probability that

Daripada suatu kajian, didapati bahawa 60% daripada pelajar-pelajar SMK Kampung Gajah pergi ke sekolah dengan menaiki bas. Jika satu sampel yang terdiri daripada 7 orang pelajar dipilih secara rawak daripada sekolah itu, cari kebarangkalian bahawa

(*a*) exactly 4 students go to the school by bus,

[2 *marks*]

tepat 4 orang pelajar pergi ke sekolah dengan menaiki bas,

[2 *markah*]

(*b*) more than 5 students go to the school by bus.

[2 *marks*]

lebih daripada 5 orang pelajar pergi ke sekolah dengan menaiki bas.

[2 *markah*]

Answer / *Jawapan* : (*a*) .....

(*b*) .....

25 (*a*) The Diagram 5 shows the standard normal distribution graph. If $P(Z \geq -k) = 0.86$, find $P(0 \leq Z \leq k)$.

[2 *marks*]

For Examiner's Use

Rajah 5 menunjukkan graf taburan normal piawai.
Jika $P(Z \geq -k) = 0.86$, *cari* $P(0 \leq Z \leq k)$.

[2 *markah*]

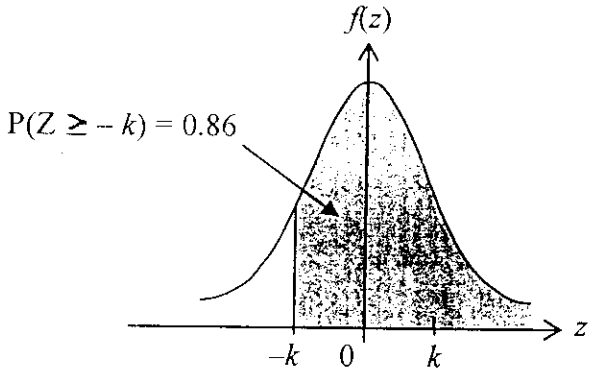

Diagram 5
Rajah 5

(*b*) X is a continuous random variable which is normally distributed with a mean of μ, and standard deviation of 15. Find the value of μ when the value of X = 58.7 correspond to the value of k from part (a).

[2 *marks*]

X *ialah pembolehubah rawak selanjar yang bertabur secara normal dengan min,* μ, *dan sisihan piawai,* 15. *Carikan nilai* μ *apabila nilai* X = 58.7 *sepadan dengan nilai k dari bahagian (a).*

[2 *markah*]

Answer / *Jawapan* : *(a)* .....

(b) μ = ...

END OF QUESTION PAPER
KERTAS SOALAN TAMAT