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

3472/1
Additional
Mathematics
Paper 1
Sept.
2010
2 jam

PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA
NEGERI PERAK
2010

ADDITIONAL MATHEMATICS

Paper 1

Dua jam

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	4	
3	3	
4	3	
5	2	
6	3	
7	3	
8	3	
9	2	
10	4	
11	3	
12	4	
13	4	
14	2	
15	4	
16	3	
17	4	
18	3	
19	4	
20	3	
21	3	
22	4	
23	3	
24	3	
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

   $= \displaystyle\int_a^b y \, dx$ or *(atau)*

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

5. Volume of revolution

   Isipadu kisaran

   $= \displaystyle\int_a^b \pi y^2 \, dx$ or *(atau)*

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

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 segi tiga*

   $= \dfrac{1}{2}\left|(x_1 y_2 + x_2 y_3 + x_3 y_1) - (x_2 y_1 + x_3 y_2 + x_1 y_3)\right|$

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

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

TRIGONOMETRY
TRIGONOMETRI

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

2. Area of sector, $A = \dfrac{1}{2}r^2\theta$
   Luas sektor, $L = \dfrac{1}{2}j^2\theta$

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. $\cos 2A = \cos^2 A - \sin^2 A$
   $\quad\quad = 2\cos^2 A - 1$
   $\quad\quad = 1 - 2\sin^2 A$

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

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

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

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

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 segi tiga*
    $= \dfrac{1}{2}ab\sin C$

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HALAMAN KOSONG

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

1 In Diagram 1, Set B shows the images of certain elements of Set A.
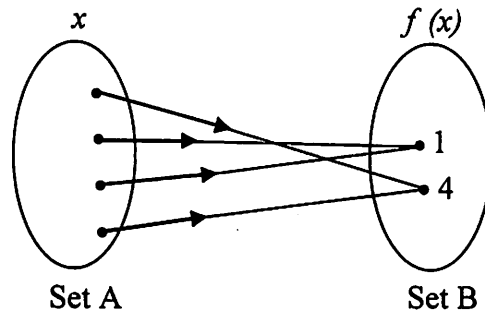*Dalam Rajah 1, Set B menunjukkan imej bagi unsur-unsur tertentu Set A.*

Diagram 1
Rajah 1

(*a*) State the type of relation between Set A and Set B.
Nyatakan jenis hubungan antara Set A dengan Set B.

(*b*) Using the function notation, write a relation between Set A and Set B.
Dengan menggunakan tatatanda fungsi, tulis satu hubungan antara Set A dengan Set B.

[2 *marks*]
[2 *markah*]

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

(b) ....

2   Given the function $f(x) = x - 2$ and $hf(x) = x^2 + 3x + 1$.

   Diberi fungsi $f(x) = x - 2$ dan $hf(x) = x^2 + 3x + 1$.

   Find
   Cari

   (a) $h(x)$,

   (b)   the value of $hf(-2)$.
          nilai bagi $hf(-2)$.

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

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

                        (b) ....

3   Given the composite function $fg(x) = 2x^2 - 3$ and function $g(x) = 3 - x^2$,
    find $f(-2)$.

   Diberi fungsi gubahan $fg(x) = 2x^2 - 3$ dan fungsi $g(x) = 3 - x^2$, cari $f(-2)$.

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

   Answer / *Jawapan* : ....

4 If the straight line $y = 1 - mx$ touches the curve $y = x^2 - 4x + m$ at a point, determine the values of m.

Jika garis lurus $y = 1 - mx$ menyentuh lengkung $y = x^2 - 4x + m$ pada satu titik, tentukan nilai-nilai m.

[3 marks]
[3 markah]

Answer / *Jawapan* : ....

5 The equation of a curve is given as $f(x) = 5 - (x + 3)^2$, find
Persamaan suatu lengkung diberi sebagai $f(x) = 5 - (x + 3)^2$, cari

(a) the coordinates of the maximum point,
koordinat titik maksimum lengkung itu,

(b) equation of the axis of symmetry of the curve.
persamaan paksi simetri lengkung itu.

[2 marks]
[2 markah]

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

(b) ....

6 Given $y = 2x^2 - 15$, find the range of x if $y + x \geq 0$.

Diberi $y = 2x^2 - 15$, cari julat nilai x jika $y + x \geq 0$.

[3 marks]
[3 markah]

Answer / *Jawapan* : ....

7 Solve the equation $4^{x-1} = 8^{x+3}$.

Selesaikan persamaan $4^{x-1} = 8^{x+3}$.

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

Answer / *Jawapan* : $x = $ ....

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8 Solve the equation $\log_2(x + 7) - 2 = \log_2 5x$.

Selesaikan persamaan $\log_2(x + 7) - 2 = \log_2 5x$.

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

Answer / *Jawapan* : $x = $ ....

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9 The first three terms of a geometric progression are 5, $\dfrac{x}{3}$, $\dfrac{20}{9}$. Find the value of x, given $x > 0$.

Tiga sebutan pertama satu janjang geometri ialah 5, $\dfrac{x}{3}$, $\dfrac{20}{9}$. Cari nilai x, diberi $x > 0$.

[2 *marks*]
[2 *markah*]

Answer / *Jawapan* : $x = $ ....

10 Given that $\dfrac{m}{99}$ = 2.020202......

$$= 2 + a + b + ...$$

Diberi $\dfrac{m}{99}$ = 2.020202......

$$= 2 + a + b + ...$$

Find the value of *a, b* and *m*.
Cari nilai a, b dan m.

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

Answer / *Jawapan* : *a* = ...

b = ...

m = ...

11 The first 3 terms of an arithmetic progression are 1– 2*k, k* + 4, 7*k* – 2.
Tiga sebutan pertama satu janjang aritmetik ialah 1– 2k, k + 4, 7k – 2.

Find
Cari
(*a*)   the value of *k*,
      nilai k,

(*b*)   the sum of the first 8 terms of the arithmetic progression.
      hasil tambah 8 sebutan pertama janjang aritmetik itu.

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

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

(b) ....

12 The variables x and y are related by the equation $y = px^q$, where p and q are constants.

A straight line graph is obtained by plotting $\log_{10} y$ against $\log_{10} x$, as shown in Diagram 12.

Pembolehubah x dan y dihubungkan oleh persamaan $y = px^q$, dengan keadaan p dan q ialah pemalar.

Graf garis lurus diperoleh dengan memplot $\log_{10} y$ melawan $\log_{10} x$, seperti ditunjukkan pada Rajah 12.
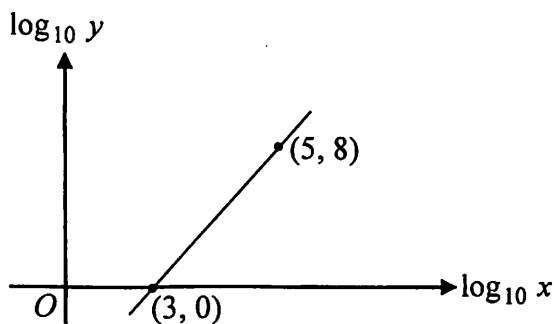

Diagram 12
Rajah 12

(a) Convert the equation $y = px^q$ to linear form,

Tukarkan persamaan $y = px^q$ kepada bentuk linear,

(b) Find the value of q and $\log_{10} p$.

Cari nilai q dan $\log_{10} p$.

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

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

(b) q = ...

$\log_{10} p$ = ...

13 Diagram 13 shows a triangle *PQR* and sector *PQT* with centre *P*.
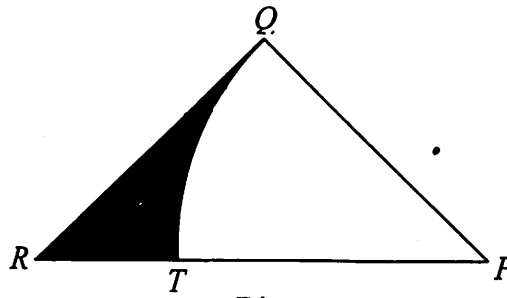*Rajah* 13 *menunjukkan satu segi tiga PQR dan sektor PQT berpusat P.*

Diagram 13
Rajah 13

It is given that $PQ = QR = 8$ cm and $\angle PQR = \dfrac{1}{2}\pi$ radian. Using $\pi = 3.142$, find the area, in cm^2, of the shaded region.

Diberi bahawa PQ = QR = 8 cm dan $\angle PQR = \dfrac{1}{2}\pi$ *radian. Dengan menggunakan* $\pi = 3.142$ *, cari luas, dalam* cm^2*, kawasan berlorek.*

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

Answer / *Jawapan* : ....

14   Diagram 14 shows two vectors, $\overrightarrow{OA}$ and $\overrightarrow{PQ}$.

      Rajah 14 *menunjukkan dua vektor,* $\overrightarrow{OA}$ *dan* $\overrightarrow{PQ}$.
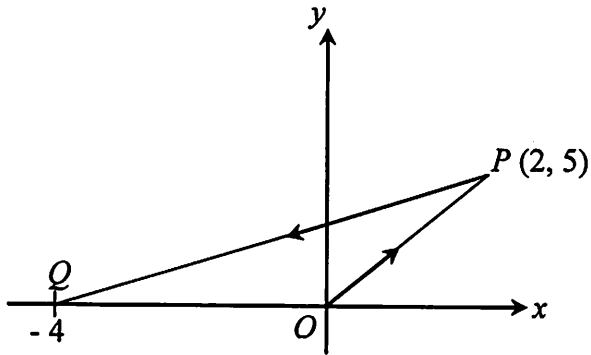

Diagram 14
Rajah 14

Express
Ungkapkan

(a) $\overrightarrow{OP}$ in the form $\begin{pmatrix} x \\ y \end{pmatrix}$,

      $\overrightarrow{OP}$ *dalam bentuk* $\begin{pmatrix} x \\ y \end{pmatrix}$,

(b) $\overrightarrow{PQ}$ in the form $x\underline{i} + y\underline{j}$.

      $\overrightarrow{PQ}$ *dalam bentuk* $x\underline{i} + y\underline{j}$.

[2 *marks*]
[2 *markah*]

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

(b) ....

15 The vectors $\overrightarrow{PQ}$ and $\overrightarrow{RS}$ are parallel. If $\overrightarrow{PQ} = 2\underline{x} - 3\underline{y}$ and

$\overrightarrow{RS} = (k-1)\underline{x} - \dfrac{3}{2}\underline{y}$, where k is a constant, find

Vektor-vektor $\overrightarrow{PQ}$ dan $\overrightarrow{RS}$ adalah selari. Jika $\overrightarrow{PQ} = 2\underline{x} - 3\underline{y}$ dan

$\overrightarrow{RS} = (k-1)\underline{x} - \dfrac{3}{2}\underline{y}$, di mana k ialah pemalar, cari

(a) the value of k,
   nilai k,

(b) the ratio of $PQ : RS$.
   nisbah bagi $PQ : RS$.

[4 marks]
[4 markah]

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

(b) ....

16 P is a point on the line segment joining the points $S(-12, 1)$ and $T(3, 6)$ such that $SP = \dfrac{1}{4}PT$. Find the coordinates of point P.

P ialah satu titik di atas gairs lurus yang menyambungkan titik S(-12, 1) dan titik T(3, 6) di mana $SP = \dfrac{1}{4}PT$. Cari koordinat titik P.

[3 marks]
[3 markah]

Answer / *Jawapan* : ....

17   Solve the equation $2\sec^2 x = \tan x + 5$ for $0° \leq x \leq 360°$.

     Selesaikan persamaan bagi $2\,\text{sek}^2 x = \tan x + 5$ untuk $0° \leq x \leq 360°$.

<div align="right">

[4 *marks*]

[4 *markah*]

</div>

Answer / *Jawapan* : ....

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18   Given that $\int_1^6 f(x)\,dx = 7$ and $\int_1^3 f(x)\,dx + \int_3^6 \left[f(x) + hx^2 \right] dx = 42$,

     find the value of h.

     Diberi bahawa $\int_1^6 f(x)\,dx = 7$ dan $\int_1^3 f(x)\,dx + \int_3^6 \left[f(x) + hx^2 \right] dx = 42$,

     cari nilai h.

<div align="right">

[3 *marks*]

[3 *markah*]

</div>

Answer / *Jawapan* : $h = $..

19 The gradient function of a curve is given by $\dfrac{dy}{dx} = \dfrac{1}{(3-x)^2} + k$,

where k is a constant.
Given that the tangent to the curve at the point $(2, -5)$ is parallel to the x-axis.

Fungsi kecerunan suatu lengkung ialah $\dfrac{dy}{dx} = \dfrac{1}{(3-x)^2} + k$,

dengan keadaan k ialah pemalar.
Diberi bahawa garis tangen kepada lengkung itu pada titik (2, −5) adalah selari dengan paksi-x.

Find
Cari
(a) the value of k,
     nilai k,

(b) the equation of the curve.
     persamaan lengkung itu.

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

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

(b) ....

20 Find the gradient of the normal to the curve $y = (2x+3)^3$ when $x = -1$.

Cari kecerunan bagi normal kepada lengkung $y = (2x+3)^3$ *apabila* $x = -1$.

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

Answer / *Jawapan* : ....

21 It is given that $y = \frac{3}{5}u^6 + 4$, where $u = 5x - 3$. Find $\frac{dy}{dx}$ in terms of x.

Diberi bahawa $y = \frac{3}{5}u^6 + 4$, dengan keadaan $u = 5x - 3$. Cari $\frac{dy}{dx}$ dalam sebutan x.

[3 marks]
[3 markah]

Answer / *Jawapan* : ....

22 Find the number of different arrangements that can be formed using all the letters in the word HARMONI, if
Cari bilangan susunan yang berlainan yang boleh dibentuk dengan menggunakan semua huruf dalam perkataan HARMONI, jika

(a) none of the letters can be repeated,
tiada huruf yang boleh diulangi,

(b) vowels and consonants should be arranged alternatively.
huruf vocal dan konsonan perlu disusun selang seli.

[4 marks]
[4 markah]

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

(b) ....

23 Ali, Bala and Chong will compete against each other in a badminton match. The probability that Ali will beat Bala and Chong are $\frac{1}{3}$ and $\frac{2}{5}$ respectively. Calculate the probability that Ali will win at least once from the match played between them.

Ali, Bala dan Chong akan bersaing di antara satu sama lain dalam satu pertandingan badminton. Kebarangkalian bahawa Ali akan menewaskan Bala dan Chong masing-masing ialah $\frac{1}{3}$ dan $\frac{2}{5}$. Kira kebarangkalian bahawa Ali akan menang sekurang-kurangnya sekali dalam perlawanan yang berlangsung di antara mereka.

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

Answer / *Jawapan* : ....

24 The standard deviation of a set of numbers m, $2m$, $3m$, $4m$ and $5m$ is p.
Sisihan piawai bagi set nombor m, 2m, 3m, 4m dan 5m ialah p.

Find the mean, $\bar{x}$ in terms of m and p.
Cari min, $\bar{x}$ dalam sebutan m dan p.

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

Answer / *Jawapan* : $\bar{x} =$ ....

[Lihat sebelah
SULIT

25 Diagram 25 shows a standard normal distribution graph which represent the
    masses of a group of students in a school.
    *Rajah 25 menunjukkan graf dengan taburan normal piawai yang mewakili jisim
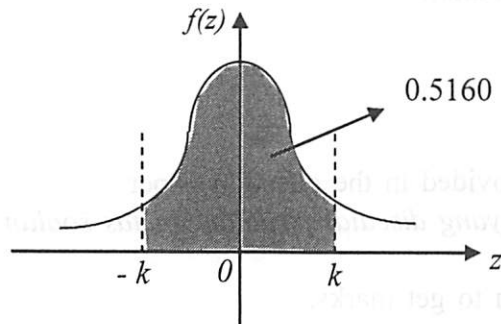   sekumpulan pelajar di sebuah sekolah.*

Diagram 25
Rajah 25

The probability of a student chosen at random from this group with a mass
between 46 kg and 60 kg is represented by the area of the shaded region.
*Kebarangkalian bahawa seorang pelajar dipilih secara rawak daripada
kumpulan ini yang mempunyai jisim di antara 46 kg dan 60 kg diwakil oleh
luas kawasan berlorek.*

(a) Find the value of k.
     Cari nilai k.

(b) The mass of students in that school is normally distributed with a mean
     of m and a standard deviation of 10. Find the value of m.
     *Jisim pelajar di sekolah itu bertaburan normal dengan min m dan sisihan
     piawai 10. Cari nilai m.*

[4 marks]
[4 markah]

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

(b) m = ...

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

skema Jawapan: www.banksoalanspm.com

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of **25** questions.
    Kertas soalan ini mengandungi 25 soalan.

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

3. Write your answers in the spaces provided in the question paper.
    Tulis jawapan anda dalam ruangan yang disediakan dalam kertas soalan ini.

4. Show your working. It may help you to get marks.
    Tunjukkan langkah-langkah dalam kerja mengira anda. Ini boleh membantu anda untuk mendapat markah.

5. If you wish to change your answer, cross out the work that you have done. Then write down the new answer.
    Sekiranya anda hendak menukar jawapan, batalkan dengan kemas jawapan yang telah dibuat. Kemudian tulis jawapan yang baru.

6. The diagrams in the questions provided are not drawn to scale unless stated.
    Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.

7. The marks allocated for each question are shown in brackets.
    Markah yang diperuntukkan bagi setiap soalan ditunjukkan dalam kurungan.

8. A list of formulae is provided on pages 2 to 4.
    Satu senarai rumus disediakan di halaman 2 hingga 4.

9. You may use a non-programmable scientific calculator.
    Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.

10. Hand in this question paper to the invigilator at the end of the examination.
    Serahkan kertas soalan ini kepada pengawas peperiksaan pada akhir peperiksaan.