

LOGA  
SEKOLAH

Nama :

Tingkatan:

UNIT PEPERIKSAAN

SEKOLAH MENENGAH KEBANGSAAN MALIM

**PEPERIKSAAN PERCUBAAN  
SIJIL PELAJARAN MALAYSIA 2014  
MATEMATIK TAMBAHAN**

**Kertas 1  
September  
2 jam**

**3472/1**

**Dua jam**

**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU**

1. This question paper consists of 25 questions  
*Kertas soalan ini mengandungi 25 soalan.*
2. Answer **all** questions.  
*Jawab **semua** soalan.*
3. Give only **one** answer for each question  
*Bagi setiap soalan berikan **satu** jawapan sahaja.*
4. Write the answers clearly in the space provided in the question paper.  
*Jawapan hendaklah ditulis pada ruang yang disediakan dalam kertas soalan.*
5. Show your working. It may help you to get marks.  
*Tunjukkan langkah-langkah penting dalam kerja mengira anda. Ini boleh membantu anda untuk mendapatkan markah.*
6. 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 kerja mengira yang telah dibuat. Kemudian tulis jawapan yang baru.*
7. The diagram in the questions provided are not drawn to scale unless stated.  
*Rajah yang mengiringi soalan ini tidak dilukiskan mengikut skala kecuali dinyatakan.*
8. The marks allocated for each question and sub-part of a question are shown in brackets.  
*Markah yang diperuntukkan bagi setiap soalan atau ceraian soalan ditunjukkan dalam kurungan.*
9. A list of formulae is provided on page 2 to 3  
*Satu senarai rumus disediakan di halaman 2 hingga 3*
10. You may use a non-programmable scientific calculator.  
*Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.*
- 11 *This question paper must be handed in at the end of the examination.  
Kertas soalan ini hendaklah diserahkan pada akhirpeperiksaan .*

| Kod<br>Pemeriksa |                 |                     |
|------------------|-----------------|---------------------|
| Soalan           | Markah<br>Penuh | Markah<br>Diperoleh |
| 1                | 2               |                     |
| 2                | 3               |                     |
| 3                | 3               |                     |
| 4                | 3               |                     |
| 5                | 3               |                     |
| 6                | 3               |                     |
| 7                | 3               |                     |
| 8                | 4               |                     |
| 9                | 4               |                     |
| 10               | 3               |                     |
| 11               | 3               |                     |
| 12               | 3               |                     |
| 13               | 3               |                     |
| 14               | 2               |                     |
| 15               | 3               |                     |
| 16               | 3               |                     |
| 17               | 4               |                     |
| 18               | 4               |                     |
| 19               | 3               |                     |
| 20               | 3               |                     |
| 21               | 3               |                     |
| 22               | 3               |                     |
| 23               | 4               |                     |
| 24               | 4               |                     |
| 25               | 3               |                     |
| Jumlah           | 80              |                     |

Kertas soalan ini mengandungi **21** halaman bercetak

**[ Lihat halaman sebelah**

**3472/1**

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)

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

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

$$3 \quad \frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$$

$$4 \quad \text{Area under a curve ( Luas dibawah lengkung)}$$

$$= \int_a^b y \, dx \quad \text{or}$$

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

$$5 \quad \text{Volume generated ( Isipadu Janaan)}$$

$$= \int_a^b \pi y^2 \, dx \quad \text{or}$$

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

### GEOMETRY (GEOMETRI)

$$1 \quad \text{Distance (Jarak)} = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

$$2 \quad \text{Midpoint ( Titik Tengah )}$$

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

$$3 \quad |r| = \sqrt{x^2 + y^2}$$

$$4 \quad \hat{r} = \frac{xi + yj}{\sqrt{x^2 + y^2}}$$

$$5 \quad \text{A point dividing a segment of a line Titik yang membahagi suatu tembereng garis}$$

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

$$6 \quad \text{Area of triangle ( Luas Segitiga )}$$

$$\frac{1}{2} |(x_1 y_2 + x_2 y_3 + x_3 y_1) - (x_2 y_1 + x_3 y_2 + x_1 y_3)|$$

[ Lihat halaman sebelah

## STATISTICS (STATISTIK)

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

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

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

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

$$5 \quad m = L + \left[ \frac{\frac{1}{2}N - F}{f_m} \right] C$$

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

$$7 \quad \bar{I} = \frac{\sum w_1 I_1}{\sum w_1}$$

$$8 \quad {}^n P_r = \frac{n!}{(n-r)!}$$

$$9 \quad {}^n C_r = \frac{n!}{(n-r)!r!}$$

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

$$11 \quad P(X = r) = {}^n C_r p^r q^{n-r}, p + q = 1$$

$$12 \quad \text{Mean (min)} \mu = np$$

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

$$14 \quad z = \frac{x - \mu}{\sigma}$$

## TRIGONOMETRY (TRIGONOMETRI)

$$1 \quad \text{Arc length, } s = r\theta$$

(Panjang lengkok)  $s = j \theta$

$$2 \quad \text{Area of sector, } L = \frac{1}{2} r^2 \theta$$

$$(\text{Luas sector}) L = \frac{1}{2} j^2 \theta$$

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

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

$$5 \quad \operatorname{cosec}^2 A = 1 + \cot^2 A$$

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

$$7 \quad \begin{aligned} \cos 2A &= \cos^2 A - \sin^2 A \\ &= 2 \cos^2 A - 1 \\ &= 1 - 2 \sin^2 A \end{aligned}$$

$$8 \quad \tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$$

$$9 \quad \sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$$

$$10 \quad \cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$$

$$11 \quad \tan(A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$$

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

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

$$14 \quad \text{Area of triangle} = \frac{1}{2} ab \sin C$$

(Luas Segitiga)

For  
examiner's  
use only

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

- 1 In Diagram 1 set  $B$  shows the images of the elements of set  $A$ .  
Dalam Rajah 1, set  $B$  menunjukkan imej-imej bagi unsur-unsur dalam set  $A$ .

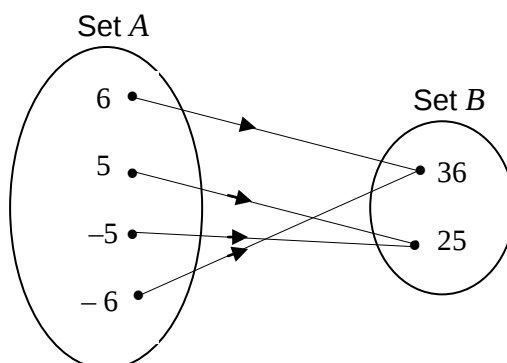


Diagram 1  
Rajah 1

- (a) State the object of 25.  
Nyatakan objek bagi 25.
- (b) Write a relation between set  $A$  and set  $B$  by using the function notation.  
Tuliskan hubungan antara set  $A$  dan set  $B$  menggunakan tatatanda fungsi.

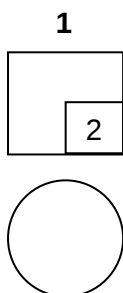
[2 marks]

[2 markah]

Answer/ Jawapan:

(a)

(b)



- 2 Given the function  $g : x \rightarrow 3x - 2$  and  $h : x \rightarrow \frac{4}{x+2}$ ,  $x \neq p$  where  $p$  is a constant

For  
examiner's  
use only

Diberi fungsi  $g : x \rightarrow 3x - 2$  dan  $h : x \rightarrow \frac{4}{x+2}$ ,  $x \neq p$  dengan keadaan  $p$  ialah pemalar.

- (a) determine the value of  $p$   
tentukan nilai  $p$

- (b) find the value of  $hg(2)$   
cari nilai  $hg(2)$

[3 marks]

[3 markah]

Answer/Jawapan:

(a)

(b)

2



- 3 Given that  $g : x \rightarrow 3x - 2$  and  $h : x \rightarrow 6x - 1$ . Find  $gh^{-1}(x)$ .

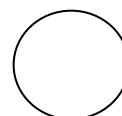
Diberi  $g : x \rightarrow 3x - 2$  dan  $h : x \rightarrow 6x - 1$ . Cari  $gh^{-1}(x)$ .

[3 marks]

[3 markah]

Answer/ Jawapan:

3



For  
examiner's  
use only

- 4 Find the values of  $k$  if  $x^2 + 2kx + 2 - k = 0$  has two equal roots.

Cari nilai-nilai  $k$  jika  $x^2 + 2kx + 2 - k = 0$  mempunyai dua punca sama.

[3 marks]

[3 markah]

Answer /Jawapan:

4

|   |
|---|
| 3 |
|---|

- 5 Find the range of values of  $x$  for which  $x(x - 8) > x - 20$ .

Cari julat bagi nilai  $x$  apabila  $x(x - 8) > x - 20$

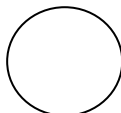
[3 marks]

[3 markah]

Answer/ Jawapan:

5

|   |
|---|
| 3 |
|---|



- 6 Diagram 6 shows the graph of the quadratic function  $y = f(x)$ . The straight line  $y = -14$  is a tangent to the curve  $y = f(x)$ .

Rajah 6 menunjukkan fungsi kuadratik  $y = f(x)$ . Garis lurus  $y = -14$  ialah tangen kepada lengkung  $y = f(x)$ .

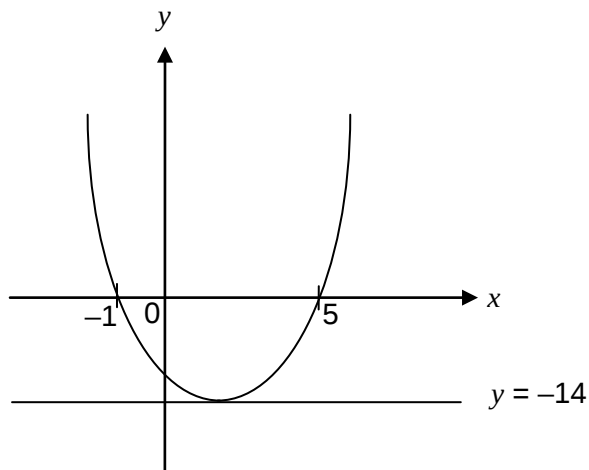


Diagram 6  
Rajah 6

- (a) State the equation of the axis of symmetry of the curve.  
*Nyatakan persamaan paksi simetri bagi lengkung itu.*
- (b) Express  $f(x)$  in the form of  $(x + p)^2 + q$ , where  $p$  and  $q$  are constants.  
*Ungkapkan  $f(x)$  dalam bentuk  $(x + p)^2 + q$ , di mana  $p$  dan  $q$  adalah pemalar.*

[3 marks]

[3 markah]

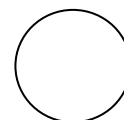
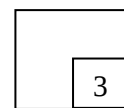
Answer / Jawapan :

(a)

(b)

For  
examiner's  
use only

6



8

For  
examiner's  
use only

7 Solve the equation  $2 \times 4^{x-1} = 16^{2x}$ .

*Selesaikan persamaan  $2 \times 4^{x-1} = 16^{2x}$*

[3 marks]

[3 markah]

Answer /Jawapan :

7

|   |
|---|
| 3 |
|---|

8 Solve the equation

*Selesaikan persamaan*

$$\log_4 y + \log_2 y = 3$$

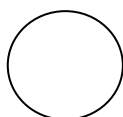
[4 marks]

[4 markah]

Answer/ Jawapan :

8

|   |
|---|
| 4 |
|---|



- 9** The first three terms of an arithmetic progression are 3, 8, 13.  
*Tiga sebutan pertama bagi jangjang aritmetik ialah 3, 8, 13.*

Find

*Cari*

- (a) the common difference of the progression,  
*beza sepunya jangjang ini*
- (b) the sum of the immediate 12 terms after the 8th term.  
*hasil tambah bagi 12 sebutan yang seterusnya selepas sebutan ke-8.*

[4 marks]

[4 markah]

Answer/ Jawapan :

(a)

(b)

*For  
examiner's  
use only*

**9**



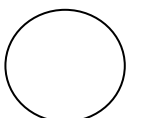
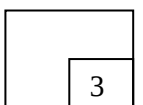
- 10** Express the recurring decimals 0.121212..... as a fraction in its simplest form.  
*Ungkapan pecahan berulang 0.121212..... sebagai satu pecahan dalam bentuk termudah.*

[3 marks]

[3 markah]

Answer/ Jawapan :

**10**



For  
examiner's  
use only

- 11** The straight line  $8x + 4hy - 6 = 0$  is perpendicular to the straight line  $3x + y = 16$ . Find the value of  $h$ .

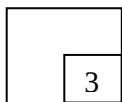
*Garis lurus  $8x + 4hy - 6 = 0$  adalah berserenjang dengan garis lurus  $3x + y = 16$ . Cari nilai  $h$ .*

[3 marks]

[3 markah]

Answer/Jawapan :

11



- 12**  $P(2m, 3n)$ ,  $Q(m, n)$  and  $R(6, 2)$  lies on a straight line.  $Q$  divides  $PR$  in the ratio  $3 : 2$ . Find the value of  $m$  and  $n$ .

*$P(2m, 3n)$ ,  $Q(m, n)$  dan  $R(6, 2)$  berada di atas garis lurus.  $Q$  membahagi  $PR$  dengan nisbah  $3 : 2$ .*

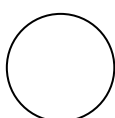
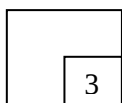
*Cari nilai  $m$  dan  $n$ .*

[3 marks]

[3 markah]

Answer/ Jawapan :

12



- 13** Diagram 13 shows a parallelogram  $PQRS$  and the point  $T$  lies on the straight line  $QS$ .

*Rajah 13 menunjukkan sebuah seg empat selari  $PQRS$  dan titik  $T$  terletak pada garis lurus  $QS$ .*

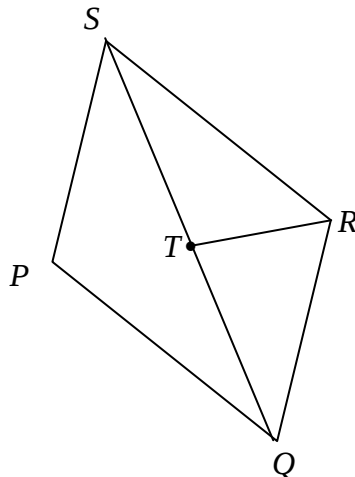


Diagram 13  
Rajah 13

Given that  $\vec{PQ} = 4\vec{x}$ ,  $\vec{QR} = 3\vec{y}$  and  $ST = TQ$ . Express in terms of  $\vec{x}$  and  $\vec{y}$ .

Diberi  $\vec{PQ} = 4\vec{x}$ ,  $\vec{QR} = 3\vec{y}$  dan  $ST = TQ$ . Ungkapkan dalam sebutan  $\vec{x}$  dan  $\vec{y}$ .

(a)  $\vec{QS}$

(b)  $\vec{TR}$

[3 marks]

[3 markah]

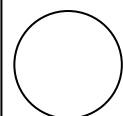
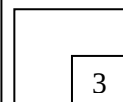
Answer / Jawapan:

(a)

(b)

For  
examiner's  
use only

13



For  
examiner's  
use only

- 12
- 14 Diagram 14 shows two vectors  $\vec{OA}$  and  $\vec{OB}$  on a Cartesian plane.  
Rajah 14 menunjukkan dua vektor  $\vec{OA}$  dan  $\vec{OB}$  pada satah Cartesian.

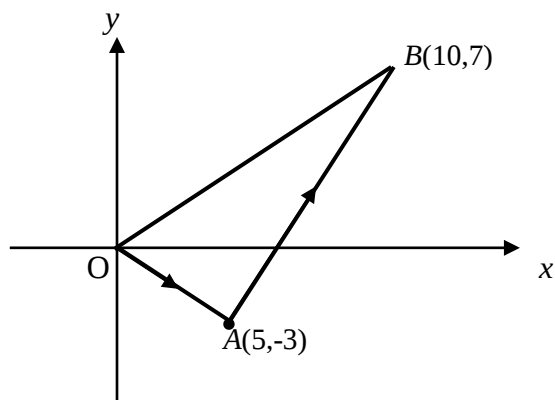


Diagram 14  
Rajah 14

- (a) State  $\vec{OA}$  in the form of  $x\mathbf{i} + y\mathbf{j}$ .  
Nyatakan  $\vec{OA}$  dalam bentuk  $x\mathbf{i} + y\mathbf{j}$

- (b) Express  $\vec{AB}$  in the form of  $\begin{pmatrix} x \\ y \end{pmatrix}$   
Ungkapkan  $\vec{AB}$  dalam bentuk  $\begin{pmatrix} x \\ y \end{pmatrix}$

[2 marks]

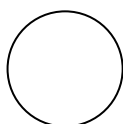
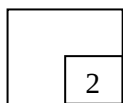
[2 markah]

Answer/ Jawapan :

(a)

(b)

14



- 15 The variables  $x$  and  $y$  are related by the equation  $y = \frac{p}{\sqrt{x}} + k\sqrt{x}$ .

Diagram 15 shows a straight line graph obtained by plotting  $y\sqrt{x}$  against  $x$ .

Pembolehubah  $x$  dan  $y$  dihubungkan oleh persamaan  $y = \frac{p}{\sqrt{x}} + k\sqrt{x}$ .

Rajah 15 menunjukkan graf garis lurus yang diperolehi dengan memplot  $y\sqrt{x}$  melawant  $x$ .

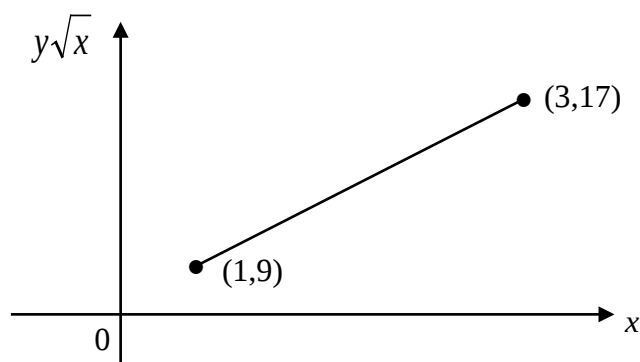


Diagram 15  
Rajah 15

Find the value of  $p$  and of  $k$ .

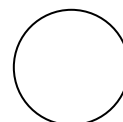
Cari nilai  $p$  dan nilai  $k$ .

[3 marks]

[3 markah]

Answer/Jawapan :

15



For  
examiner's  
use only

- 16** It is given that  $\tan x = \frac{4}{3}$ , where  $180^\circ < x < 270^\circ$ .

Diberi bahawa  $\tan x = \frac{4}{3}$ , dengan keadaan  $180^\circ < x < 270^\circ$ .

Find the value of

cari nilai bagi

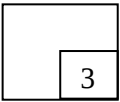
- (a)  $\cot x$ .  
(b)  $\operatorname{cosec} x$   
 $\operatorname{cosec} x$

[3 marks]

[3 markah]

Answer/ Jawapan :

16



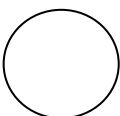
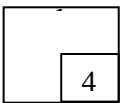
- 17** Solve the equation  $3\cos 2x + 5 = 8\sin x$  for  $0^\circ \leq x \leq 360^\circ$   
Selesaikan persamaan  $3\cos 2x + 5 = 8\sin x$  bagi  $0^\circ \leq x \leq 360^\circ$

[4 marks]

[4 markah]

Answer/Jawapan:

17



- 18** Diagram 18 shows a semicircle  $OABC$ . The length of the arc  $BC$  is 3 cm.  
*Rajah 18 menunjukkan sebuah semi bulatan  $OABC$ . Panjang lengkok  $BC$  ialah 3 cm.*

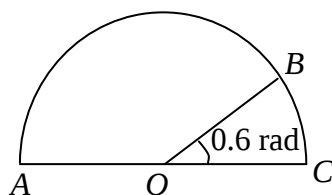


Diagram 18  
*Rajah 18*

Find

*Cari*

[Use/ *Guna*  $\pi = 3.412$ ]

- (a) the length, in cm, of the radius of the semicircle.  
*panjang, dalam cm, jejari semi bulatan itu*
- (b) the area, in  $\text{cm}^2$ , of sector  $AOB$   
*luas, dalam  $\text{cm}^2$ , sector  $AOB$*

[4 marks]

[4 markah]

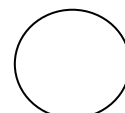
Answer/ *Jawapan* :

(a)

(b)

*For  
 examiner's  
 use only*

18



For  
examiner's  
use only

- 19** Two variables,  $x$  and  $y$  are related by the equation  $y = 2x^2 - \frac{1}{x}$ . Given that  $y$  increases with a rate of 3 units per second, calculate the rate of change of  $x$  when  $x = 2$  cm.
- Dua pembolehubah,  $x$  dan  $y$ , dihubungkan oleh persamaan  $y = 2x^2 - \frac{1}{x}$ . Diberi bahawa  $y$  meningkat dengan kadar 3 unit sesaat, hitung kadar perubahan  $x$  apabila  $x = 2$  cm.*

[3 marks]

[3 markah]

Answer/ Jawapan :

19



- 20** Given  $\int (2x^2 - 3)dx = mx^3 - 3x + c$ , where  $m$  and  $c$  are constants. Find

*Diberi  $\int (2x^2 - 3)dx = mx^3 - 3x + c$ , di mana  $m$  dan  $c$  ialah pemalar. Cari*

(a) the value of  $m$   
*nilai bagi  $m$*

(b) the value of  $c$  if  $\int (2x^2 - 3)dx = 3$  when  $x = 2$ .  
*nilai bagi  $c$  jika  $\int (2x^2 - 3)dx = 3$  apabila  $x = 2$ .*

[ 3 marks]

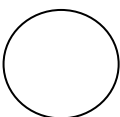
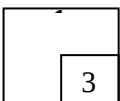
[3 markah]

Answer/ Jawapan :

(a)

(b)

20



21. Given that  $\int_1^3 f(x)dx = 8$  and  $\int_3^1 g(x)dx = 5$ , find the value of

$$\int_1^3 \left[ 3f(x) - \frac{1}{2}g(x) + x \right] dx.$$

Diberi bahawa  $\int_1^3 f(x)dx = 8$  dan  $\int_3^1 g(x)dx = 5$ , cari nilai bagi

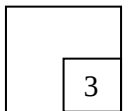
$$\int_1^3 \left[ 3f(x) - \frac{1}{2}g(x) + x \right] dx.$$

[ 3 marks]

[3 markah]

Answer/ Jawapan :

21



- 22 A set of data consists of 5 numbers. The sum of the numbers is 59 and the sum of squares of the numbers is 747. Calculate

Satu set data terdiri daripada 5 nombor. Jumlah bagi nombor ini ialah 59 dan jumlah kuasa dua bagi nombor ini ialah 747. Kirakan

(a) mean  
min

(b) standard deviation of the data if a number of 12 is removed.  
sisihan piawai bagi data ini jika satu nombor 12 dikeluarkan.

[4 marks]

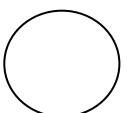
[4 markah]

Answer / Jawapan:

(a)

(b)

22



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23

Diagram 23 shows six letter cards.

Rajah 23 menunjukkan enam keeping kad huruf.



Diagram 23

Rajah 23

A four-letter code is to be formed using four of these cards.

Suatu kod empat huruf hendak dibentuk dengan menggunakan empat daripada kad-kad itu.

Find

Cari

- (a) the number of different four-letter codes that can be formed.  
*bilangan kod empat huruf yang berlainan yang dapat dibentuk.*
- (b) the number of different four-letter codes which must contain the letter A.  
*bilangan kod empat huruf yang berlainan yang mesti mengandungi huruf A.*

[ 4 marks]

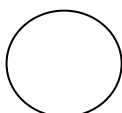
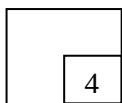
[4 markah]

Answer/ Jawapan :

(a)

(b)

23



- 24** A bag contains 5 red marbles, 6 green marbles and 7 white marbles.

*Satu beg mengandungi 5 guli merah , 6 guli hijau dan 7 guli putih.*

- (a) A marble is drawn at random from the bag.  
Calculate the probability that a red or a white marble is drawn.

*Satu guli dikeluarkan secara rawak daripada beg itu.*

*Cari kebarangkalian bahawa satu guli merah atau satu guli putih dikeluarkan*

- (b) Two marbles are drawn simultaneously at random from the bag.  
Calculate the probability that both marbles drawn are of the same colour.

*Dua guli dikeluarkan serentak secara rawak daripada beg itu.*

*Cari kebarangkalian bahawa kedua-dua guli itu adalah sama warna.*

[4 marks]

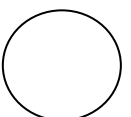
[4 markah]

Answer/ Jawapan:

(a)

(b)

24



For  
examiner's  
use only

- 25 Diagram 25 shows a standardised normal distribution graph.  
Rajah 25 menunjukkan satu graf taburan normal piawai.

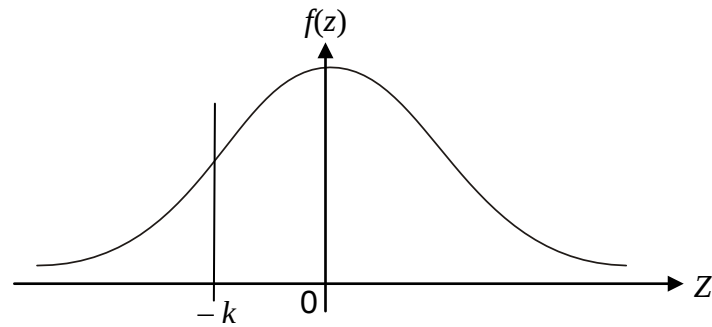


Diagram 25  
Rajah 25

If  $P(Z > -k) = 0.7623$ . Find  $P(0 < Z < k)$ .

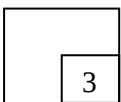
$P(Z > -k) = 0.7623$ . Cari  $P(0 < Z < k)$ .

[3 marks]

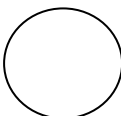
[3 markah]

Answer / Jawapan:

25



3



END OF THE QUESTION PAPER  
KERTAS SOALAN TAMAT

**THE UPPER TAIL PROBABILITY  $Q(z)$  FOR THE NORMAL DISTRIBUTION  $N(0,1)$   
KEBARANGKALIAN HUJUNG ATAS  $Q(z)$  BAGI TABURAN NORMAL  $N(0, 1)$**

| $z$ | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | Minus / Tolak |   |    |    |    |    |    |    |    |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------------|---|----|----|----|----|----|----|----|
| 0.0 | 0.5000 | 0.4960 | 0.4920 | 0.4880 | 0.4840 | 0.4801 | 0.4761 | 0.4721 | 0.4681 | 0.4641 | 4             | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 |
| 0.1 | 0.4602 | 0.4562 | 0.4522 | 0.4483 | 0.4443 | 0.4404 | 0.4364 | 0.4325 | 0.4286 | 0.4247 | 4             | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 |
| 0.2 | 0.4207 | 0.4168 | 0.4129 | 0.4090 | 0.4052 | 0.4013 | 0.3974 | 0.3936 | 0.3897 | 0.3859 | 4             | 8 | 12 | 15 | 19 | 23 | 27 | 31 | 35 |
| 0.3 | 0.3821 | 0.3783 | 0.3745 | 0.3707 | 0.3669 | 0.3632 | 0.3594 | 0.3557 | 0.3520 | 0.3483 | 4             | 7 | 11 | 15 | 19 | 22 | 26 | 30 | 34 |
| 0.4 | 0.3446 | 0.3409 | 0.3372 | 0.3336 | 0.3300 | 0.3264 | 0.3228 | 0.3192 | 0.3156 | 0.3121 | 4             | 7 | 11 | 15 | 18 | 22 | 25 | 29 | 32 |
| 0.5 | 0.3085 | 0.3050 | 0.3015 | 0.2981 | 0.2946 | 0.2912 | 0.2877 | 0.2843 | 0.2810 | 0.2776 | 3             | 7 | 10 | 14 | 17 | 20 | 24 | 27 | 31 |
| 0.6 | 0.2743 | 0.2709 | 0.2676 | 0.2643 | 0.2611 | 0.2578 | 0.2546 | 0.2514 | 0.2483 | 0.2451 | 3             | 7 | 10 | 13 | 16 | 19 | 23 | 26 | 29 |
| 0.7 | 0.2420 | 0.2389 | 0.2358 | 0.2327 | 0.2296 | 0.2266 | 0.2236 | 0.2206 | 0.2177 | 0.2148 | 3             | 6 | 9  | 12 | 15 | 18 | 21 | 24 | 27 |
| 0.8 | 0.2119 | 0.2090 | 0.2061 | 0.2033 | 0.2005 | 0.1977 | 0.1949 | 0.1922 | 0.1894 | 0.1867 | 3             | 5 | 8  | 11 | 14 | 16 | 19 | 22 | 25 |
| 0.9 | 0.1841 | 0.1814 | 0.1788 | 0.1762 | 0.1736 | 0.1711 | 0.1685 | 0.1660 | 0.1635 | 0.1611 | 3             | 5 | 8  | 10 | 13 | 15 | 18 | 20 | 23 |
| 1.0 | 0.1587 | 0.1562 | 0.1539 | 0.1515 | 0.1492 | 0.1469 | 0.1446 | 0.1423 | 0.1401 | 0.1379 | 2             | 5 | 7  | 9  | 12 | 14 | 16 | 19 | 21 |
| 1.1 | 0.1357 | 0.1335 | 0.1314 | 0.1292 | 0.1271 | 0.1251 | 0.1230 | 0.1210 | 0.1190 | 0.1170 | 2             | 4 | 6  | 8  | 10 | 12 | 14 | 16 | 18 |
| 1.2 | 0.1151 | 0.1131 | 0.1112 | 0.1093 | 0.1075 | 0.1056 | 0.1038 | 0.1020 | 0.1003 | 0.0985 | 2             | 4 | 6  | 7  | 9  | 11 | 13 | 15 | 17 |
| 1.3 | 0.0968 | 0.0951 | 0.0934 | 0.0918 | 0.0901 | 0.0885 | 0.0869 | 0.0853 | 0.0838 | 0.0823 | 2             | 3 | 5  | 6  | 8  | 10 | 11 |    |    |

LOGO  
SEKOLAH

UNIT PEPERIKSAAN  
SEKOLAH MENENGAH KEBANGSAAN MALIM

PEPERIKSAAN PERCUBAAN  
SIJIL PELAJARAN MALAYSIA 2014  
MATEMATIK TAMBAHAN  
Kertas 2  
September

3472/2

$2\frac{1}{2}$  jam

Dua jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. This question paper consists of three sections : **Section A, Section B** and **Section C**  
*Kertas soalan ini mengandungi tiga bahagian : **Bahagian A, Bahagian B** dan **Bahagian C**.*
2. Answer **all** questions in Section A, **four** questions from Section B and **two** questions from Section C.  
*Jawab semua soalan dalam Bahagian A, empat soalan daripada Bahagian B, dan dua soalan daripada Bahagian C.*
3. Give only one answer/solution to each question.  
*Bagi setiap soalan, berikan satu jawapan / penyelesaian sahaja.*
4. Show your working. It may help you to get marks.  
*Tunjukkan langkah-langkah penting dalam kerja mengira anda. Ini boleh membantu anda untuk mendapatkan markah.*
5. The diagrams in the questions provided are not drawn to scale unless stated.  
*Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan.*
6. The marks allocated for each question and sub-part of a question are shown in brackets  
*Markah yang diperuntukkan bagi setiap soalan dan ceraihan soalan ditunjukkan dalam kurungan.*
7. A list of formulae is provided on pages 2 and 3.  
*Satu senarai rumus disediakan di halaman 2 dan 3.*
8. A booklet of four-figure mathematical tables is provided.  
*Buku sifir matematik empat angka boleh digunakan.*
9. You may use a non-programmable scientific calculator.  
*Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.*

Kertas soalan ini mengandungi 17 halaman bercetak

[ Lihat halaman sebelah

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)

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

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

$$3 \quad \frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$$

$$4 \quad \text{Area under a curve (Luas dibawah lengkung)}$$

$$= \int_a^b y \, dx \quad \text{or}$$

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

$$5 \quad \text{Volume generated (Isipadu Janaan)}$$

$$= \int_a^b \pi y^2 \, dx \quad \text{or}$$

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

### GEOMETRY (GEOMETRI)

$$1 \quad \text{Distance (Jarak)} = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

$$2 \quad \text{Midpoint (Titik Tengah)}$$

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

$$3 \quad |r| = \sqrt{x^2 + y^2}$$

$$4 \quad \hat{r} = \frac{xi + yj}{\sqrt{x^2 + y^2}}$$

$$5 \quad \text{A point dividing a segment of a line}$$

Titik yang membahagi suatu tembereng garis

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

$$6 \quad \text{Area of triangle (Luas Segitiga)}$$

$$\frac{1}{2} |(x_1 y_2 + x_2 y_3 + x_3 y_1) - (x_2 y_1 + x_3 y_2 + x_1 y_3)|$$

[ Lihat halaman sebelah

**STATISTICS (STATISTIK)**

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

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

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

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

$$5 \quad m = L + \left[ \frac{\frac{1}{2}N - F}{f_m} \right] C$$

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

$$7 \quad \bar{I} = \frac{\sum w_1 I_1}{\sum w_1}$$

$$8 \quad {}^n P_r = \frac{n!}{(n-r)!}$$

$$9 \quad {}^n C_r = \frac{n!}{(n-r)!r!}$$

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

$$11 \quad P(X=r) = {}^n C_r p^r q^{n-r}, p+q = 1$$

$$12 \quad \text{Mean (min)} \quad \mu = np$$

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

$$14 \quad z = \frac{x - \mu}{\sigma}$$

**TRIGONOMETRY (TRIGONOMETRI)**

$$1 \quad \text{Arc length, } s = r\theta$$

(Panjang lengkok)  $s = r\theta$

$$2 \quad \text{Area of sector, } L = \frac{1}{2} r^2 \theta$$

$$(\text{Luas sector}) \quad L = \frac{1}{2} r^2 \theta$$

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

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

$$5 \quad \operatorname{cosec}^2 A = 1 + \cot^2 A$$

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

$$7 \quad \begin{aligned} \cos 2A &= \cos^2 A - \sin^2 A \\ &= 2 \cos^2 A - 1 \\ &= 1 - 2 \sin^2 A \end{aligned}$$

$$8 \quad \tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$$

$$9 \quad \sin (A \pm B) = \sin A \cos B \pm \cos A \sin B$$

$$10 \quad \cos (A \pm B) = \cos A \cos B \mp \sin A \sin B$$

$$11 \quad \tan (A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$$

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

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

$$14 \quad \begin{aligned} \text{Area of triangle} &= \frac{1}{2} ab \sin C \\ (\text{Luas Segitiga}) \end{aligned}$$

**Section A**  
**Bahagian A**

[40 marks]

[40 markah]

Answer **all** questions.

Jawab **semua** soalan.

1. Solve the simultaneous equations  $y - 3x = 2$  and  $3x^2 + 2y^2 - xy = 6$ .  
Give your answer correct to three decimal places.

[5 marks]

*Selesaikan persamaan serentak  $y - 3x = 2$  dan  $3x^2 + 2y^2 - xy = 6$ .*

*Beri jawapan anda betul kepada tiga tempat perpuluhan.*

[5 markah]

2. Diagram 2 shows part of the arrangement of plates with circular shape. The top plate has the diameter of 6 cm and the diameter of each subsequent plate increases by 2 cm.

*Rajah 2 menunjukkan sebahagian daripada susunan piring yang berbentuk bulatan. Piring teratas mempunyai diameter 6 cm dan diameter bagi piring yang berikutnya bertambah sebanyak 2 cm.*

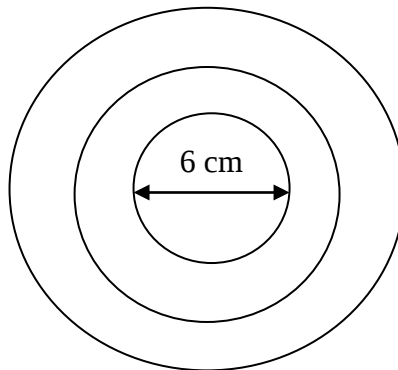


Diagram 2  
Rajah 2

- (a) Calculate the perimeter, in cm, of the 12th plate, in terms of  $\pi$ . [3 marks]

*Hitung perimeter dalam cm, piring yang ke-12, dalam sebutan  $\pi$ .* [3 markah]

- (b) Given the total perimeter of the first  $n$  plates is  $414\pi$  cm, find the value of  $n$ . [4 marks]

*Diberi jumlah perimeter bagi  $n$  piring yang pertama ialah  $414\pi$  cm, cari nilai bagi  $n$ .*

[4 markah]

3. (a) Sketch the graph of  $y = |\sin x - 1|$  for  $0 \leq x \leq 2\pi$ . [4 marks]  
*Lakarkan graf  $y = |\sin x - 1|$  untuk  $0 \leq x \leq 2\pi$ . [4 markah]*

- (b) Hence, using the same axes, sketch a suitable straight line to find the number of solutions to the equation  $|\sin x - 1| - \frac{x}{2\pi} = 0$  for  $0 \leq x \leq 2\pi$ .

State the number of solutions. [3 marks]

*Seterusnya, dengan menggunakan paksi yang sama, lakarkan satu garis lurus yang sesuai untuk mencari bilangan penyelesaian bagi persamaan*

$$|\sin x - 1| - \frac{x}{2\pi} = 0 \text{ untuk } 0 \leq x \leq 2\pi.$$

*Nyatakan bilangan penyelesaian itu.*

[3 markah]

4. The curve  $y = 4x^2 - 7x + 1$  passes through the point  $A(p, 3)$  and  $p > 0$ .

*Lengkung  $y = 4x^2 - 7x + 1$  melalui titik  $A(p, 3)$  dan  $p > 0$ .*

Find

*Cari*

- (a) the value of  $p$ . [2 marks]  
*nilai  $p$ . [2 markah]*

- (b) the equation of the tangent to the curve at  $A$ . [4 marks]  
*Persamaan tangen kepada lengkung itu pada  $A$ . [4 markah]*

5. Solutions by scale drawing will not be accepted.

*Penyelesaian secara lukisan berskala tidak diterima.*

In Diagram 5,  $LMN$  is a right-angled triangle. The straight line  $LM$  is perpendicular to the straight line  $MN$ . Given the equation of the straight line  $MN$  is  $3y + 2x + 8 = 0$ .

*Dalam Rajah 5,  $LMN$  ialah sebuah segitiga bersudut tegak. Garis lurus  $LM$  adalah berserenjang dengan garis lurus  $MN$ . Diberi persamaan garis lurus  $MN$  ialah  $3y + 2x + 8 = 0$ .*

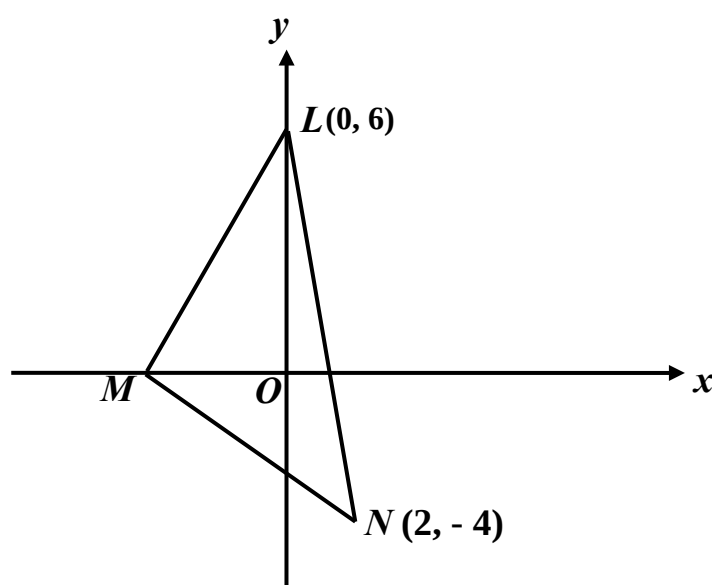


Diagram 5  
Rajah 5

- (a) Find  
*Cari*

- (i) the coordinate of  $M$ .  
*koordinat  $M$ .*
- (ii) the equation of the straight line  $LM$ .  
*persamaan garis lurus  $LM$ .*
- (iii) the area of triangle  $LMN$ .  
*luas segitiga  $LMN$ .*

[5 marks]

[5 markah]

- (b) A point  $P(x, y)$  moves such that  $2PL = PN$ .  
Find the equation of the locus of  $P$ .

[2 marks]

*Suatu titik bergerak  $P(x, y)$  bergerak dengan keadaan  $2PL = PN$ .  
Cari persamaan lokus  $P$ .*

[2 markah]

6. Table 6(i) shows the cumulative frequency distribution for the weight of 35 pupils in a class.

*Jadual 6(i) menunjukkan taburan kekerapan longgokan bagi berat 35 murid dalam satu kelas.*

|                                           |           |           |           |           |           |           |
|-------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Weight (kg)<br><i>Berat (kg)</i>          | $\leq 45$ | $\leq 50$ | $\leq 55$ | $\leq 60$ | $\leq 65$ | $\leq 70$ |
| Number of pupils<br><i>Bilangan murid</i> | 4         | 10        | 21        | 30        | 33        | 35        |

Table 6(i)  
*Jadual 6(i)*

- (a) Based on table 6(i), copy and complete table 6(ii). [1marks]  
*Berdasarkan jadual 6(i), salin dan lengkapkan jadual 6(ii)* [1 markah]

| Weight (kg)<br><i>Berat (kg)</i> | Number of pupils<br><i>Bilangan murid</i> |
|----------------------------------|-------------------------------------------|
| 41 – 45                          |                                           |
| 46 – 50                          |                                           |
| 51 – 55                          |                                           |
| 56 – 60                          |                                           |
| 61 – 65                          |                                           |
| 66 – 70                          |                                           |

Table 6(ii)  
*Jadual 6(ii)*

- (b) Without using an ogive, calculate the median weight. [3 marks]  
*Tanpa melukis ogif, hitungkan berat median.* [3 markah]
- (c) Use the graph paper to answer this question.  
*Gunakan kertas graf untuk menjawab soalan ini.*

Using a scale of 2 cm to 5 kg on the horizontal axis and 2 cm to 1 pupil on the vertical axis, draw a histogram to represent the frequency distribution of the weights. Hence, find the mode weight.

[4 marks]

*Dengan menggunakan skala 2 cm kepada 5 kg pada paksi mengufuk dan 2 cm kepada 1 orang murid pada paksi mencancang, lukis sebuah histogram untuk mewakili taburan frekuensi bagi berat. Seterusnya, cari berat mod.*

[4 markah]

**Section B**  
**Bahagian B**

[40 marks]  
[40 markah]

Answer **four** questions from this section.

Jawab **empat** soalan daripada bahagian ini.

7. Use a graph paper to answer this question.

*Gunakan kertas graph untuk menjawab soalan ini.*

Table 7 shows the values of two variables,  $x$  and  $y$ .

The variables,  $x$  and  $y$  are related by the equation  $y = hx^{x-1}$ , where  $h$  and  $k$  are constants.

*Jadual 7 menunjukkan nilai-nilai bagi dua pembolehubah,  $x$  dan  $y$ .*

*Pembolehubah  $x$  dan  $y$  dihubungkan oleh persamaan  $y = hx^{x-1}$  dengan keadaan  $h$  dan  $k$  ialah pemalar.*

|     |      |       |      |      |       |       |
|-----|------|-------|------|------|-------|-------|
| $x$ | 3    | 5     | 7    | 9    | 11    | 13    |
| $y$ | 10.2 | 19.05 | 36.6 | 66.1 | 125.9 | 229.1 |

Table 7  
*Jadual 7*

- (a) Plot  $\log_{10}y$  against  $(x - 1)$  by using a scale of 2 cm to 2 units on the  $(x - 1)$ -axis and 2 cm to 0.2 unit on the  $\log_{10}y$ -axis. Hence, draw the line of best fit.

[5 marks]

*Plot  $\log_{10}y$  melawan  $(x - 1)$  dengan menggunakan skala 2 cm kepada 2 unit pada paksi- $(x - 1)$  dan 2 cm kepada 0.2 unit pada paksi- $\log_{10}y$ . Seterusnya lukis garis lurus penyuaian terbaik.*

[5 markah]

- (b) Use your graph from 7(a) to find the values of

*Gunakan graf anda di 7(a) untuk mencari nilai*

(i)  $h$

(ii)  $k$

[5 marks]

[5 markah]

8.

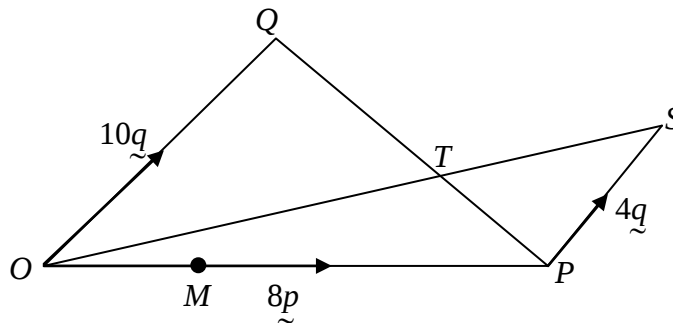


Diagram 8  
Rajah 8

In Diagram 8, given  $\vec{OP} = 8\vec{p}$ ,  $\vec{OQ} = 10\vec{q}$ ,  $\vec{PS} = 4\vec{q}$  and  $\vec{OM} = \frac{1}{4}\vec{OP}$ .

Pada Rajah 8, diberi  $\vec{OP} = 8\vec{p}$ ,  $\vec{OQ} = 10\vec{q}$ ,  $\vec{PS} = 4\vec{q}$  dan  $\vec{OM} = \frac{1}{4}\vec{OP}$ .

(a) Express each of the following in terms of  $\vec{p}$  and  $\vec{q}$

Ungkapkan bagi setiap yang berikut dalam sebutan  $\vec{p}$  and  $\vec{q}$

(i)  $\vec{OS}$

(ii)  $\vec{QP}$

(iii)  $\vec{MS}$

[3 marks]

[3 markah]

(b) Given that  $\vec{OT} = a\vec{OS}$  and  $\vec{QT} = b\vec{QP}$ , express  $\vec{OT}$  in terms of

Diberi  $\vec{OT} = a\vec{OS}$  dan  $\vec{QT} = b\vec{QP}$ , ungkapkan  $\vec{OT}$  dalam sebutan

(i)  $a$ ,  $\vec{p}$  and  $\vec{q}$

$a$ ,  $\vec{p}$  dan  $\vec{q}$

(ii)  $b$ ,  $\vec{p}$  and  $\vec{q}$

$b$ ,  $\vec{p}$  dan  $\vec{q}$

[3 marks]

[3 markah]

(c) Hence, find the value of  $a$  and of  $b$ .

[4 marks]

Seterusnya, cari nilai  $a$  dan  $b$ .

[4 markah]

9. Diagram 9 shows a semicircle with centre  $O$  and radius 12 cm inscribed in a sector  $APM$  of a circle with centre  $P$ . The straight lines,  $AP$  is tangent to the semicircle at point  $Q$ .

Rajah 9 menunjukkan sebuah semi bulatan berpusat  $O$  dan berjejari 12 cm terterap dalam sektor  $APM$  bagi sebuah bulatan berpusat  $P$ . Garis lurus  $AP$  adalah tangen kepada semibulatan di titik  $Q$ .

[ Use/Guna  $\pi = 3.142$  ]

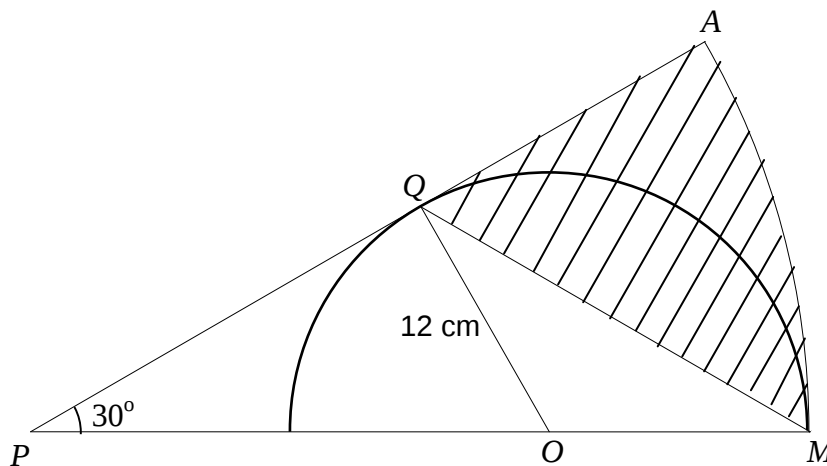


Diagram 9  
Rajah 9

- |                                                             |            |
|-------------------------------------------------------------|------------|
| (a) State the $\angle APM$ , in radians                     | [1 mark]   |
| Nyatakan $\angle APM$ , dalam radian                        | [1 markah] |
| (b) Calculate the length, in cm of the arc $AB$ .           | [4 marks]  |
| Hitung panjang dalam cm, lengkok $AB$ .                     | [4 markah] |
| (c) Find the area, in $\text{cm}^2$ , of the shaded region. | [5 marks]  |
| Cari luas, dalam $\text{cm}^2$ , kawasan berlorek           | [5 markah] |

10. (a) In a survey carried out in a school, it is found that 25% of students own a laptop.

*Dalam suatu kajian yang dijalankan ke atas murid-murid di sebuah sekolah, didapati 25% murid memiliki sebuah komputer riba.*

- (i) If 8 students from the school are chosen at random, find the probability that at least 2 students own a laptop.

*Jika 8 orang murid daripada sekolah itu dipilih secara rawak, cari kebarangkalian bahawa sekurang-kurangnya 2 orang murid memiliki sebuah komputer riba.*

- (ii) If the variance of the students who own a laptop is 135, calculate the total number of students in the school.

*Jika varians bagi murid yang memiliki sebuah komputer riba ialah 135, hitung jumlah murid dalam sekolah itu.*

[5 marks]

[5 markah]

- (b) The diameters pumpkins from a farm have a normal distribution with a mean of 8 cm and a standard deviation of 2.4 cm.

*Diameter bagi labu dari sebuah ladang adalah mengikut taburan normal dengan min 8 cm dan sisihan piawai 2.4 cm.*

Calculate

*Hitung*

- (i) the probability that a pumpkin chosen at random from this farm has a diameter less than 6.5 cm.

*kebarangkalian bahawa sebiji labu yang dipilih secara rawak dari ladang ini berdiameter kurang daripada 6.5 cm.*

- (ii) the value of  $d$  if 75% of the pumpkin have diameter greater than  $d$  cm.

*nilai  $d$  jika 75% labu daripada ladang itu mempunyai diameter melebihi  $d$  cm.*

[5 marks]

[5 markah]

11. Diagram 11 shows the curve  $y = x^2 + 2$  and the straight line  $y = -x + 8$ .  
*Rajah 11 menunjukkan lengkung  $y = x^2 + 2$  dan garis lurus  $y = -x + 8$ .*

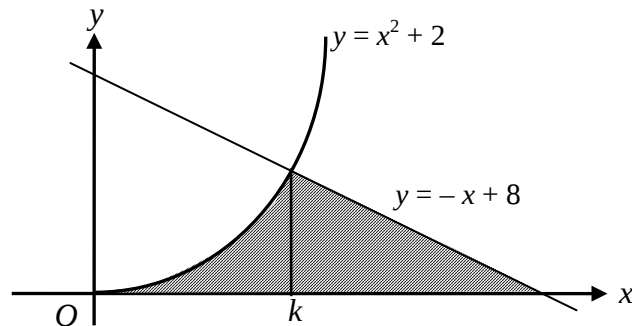


Diagram 11  
*Rajah 11*

Find

*Cari*

- (a) the value of  $k$ , [3 marks]  
*nilai  $k$ ,* [3 markah]
- (b) the area of the shaded region, [4 marks]  
*luas rantau berlorek,* [4 markah]
- (c) the volume generated in terms of  $\pi$ , when the region bounded by the curve, the  $y$ -axis and  $y = 6$  is revolved through  $360^\circ$  about the  $y$ -axis. [3 marks]

*isipadu janaan, dalam sebutan  $\pi$ , apabila rantau yang dibatasi oleh lengkung itu, paksi- $y$  dan  $y = 6$  dikisarkan melalui  $360^\circ$  pada paksi- $y$ .*

[3 markah]

**Section C**  
**Bahagian C**

[20 marks]

[20 markah]

Answer **two** questions from this section.  
Jawab **dua** soalan daripada bahagian ini.

12. Solution by scale drawing is not accepted.

*Penyelesaian secara lukisan berskala tidak diterima.*

Diagram 12 shows triangle  $KMP$  and triangle  $KNP$ .

*Rajah 12 menunjukkan segi tiga  $KMP$  dan segi tiga  $KNP$*

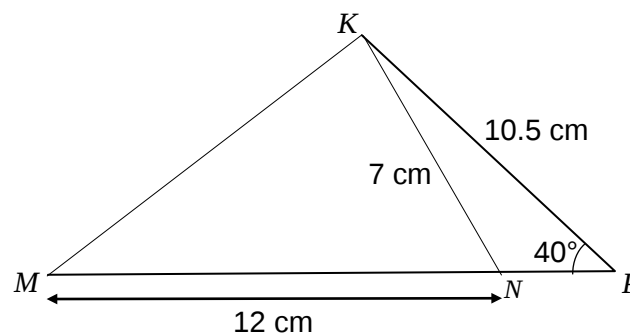


Diagram 12

*Rajah 12*

Given that  $MNP$  is a straight line and  $\angle KNP$  is obtuse .

*Diberi bahawa  $MNP$  ialah garis lurus dan  $\angle KNP$  adalah sudut cakah.*

- (a) Calculate

Hitung

- (i)  $\angle KNP$ ,
  - (ii) the length, in cm, of  $KM$ .
- panjang, dalam cm, bagi  $KM$ .*

[5 marks]

[5 markah]

- (b) Point  $N'$  lies on  $NM$  such that  $KN' = KN$ .

*Titik  $N'$  terletak di atas  $NM$  dengan keadaan  $KN' = KN$ .*

- (i) Sketch  $\triangle KN'M$ ,  
*Lakar  $\triangle KN'M$ ,*
- (ii) Hence, calculate the area, in  $\text{cm}^2$ , of  $\triangle KN'M$ .  
*Seterusnya, hitungkan luas, dalam  $\text{cm}^2$ , bagi  $\triangle KN'M$ .*

[5 marks]

[5 markah]

13. Table 13 shows the prices, price indices and weightages of four main ingredients, A, B, C and D used in making biscuits of a particular type.

*Jadual 13 menunjukkan harga, indeks harga dan pemberat empat bahan utama, A, B, C dan D, yang digunakan untuk membuat sejenis biskut.*

| Ingredient<br><i>Bahan</i> | Price per kg (RM)<br><i>Harga se kg (RM)</i> |                              | Price index in the year 2010<br>based on the year 2008<br><i>Indeks harga pada tahun 2010<br/>berdasarkan tahun 2008</i> | Weightage<br><i>Pemberat</i> |
|----------------------------|----------------------------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------|------------------------------|
|                            | Year<br><i>Tahun</i><br>2008                 | Year<br><i>Tahun</i><br>2010 |                                                                                                                          |                              |
| A                          | 2.00                                         | 2.20                         | 110                                                                                                                      | 7                            |
| B                          | 3.50                                         | 4.55                         | $x$                                                                                                                      | $z$                          |
| C                          | 5.00                                         | 6.00                         | 120                                                                                                                      | $x + 1$                      |
| D                          | 4.00                                         | $y$                          | 112                                                                                                                      | 2                            |

Table 13  
*Jadual 13*

- (a) Find the value of  $x$  and of  $y$ . [3 marks]

*Carikan nilai-nilai  $x$  dan  $y$ .* [3 markah]

- (b) The composite index for the cost of making these biscuits in the year 2010 based on the year 2008 is 116.5. Calculate the value of  $z$ .

*Indeks gubahan bagi kos membuat biskut tersebut pada tahun 2010 berdasarkan tahun 2008 ialah 116.5. Hitungkan nilai  $z$ .*

[2 marks]

[2 markah]

- (c) Given the composite index for the cost of making these biscuits increased by 40% from the year 2006 to 2010.

*Diberi indeks gubahan bagi kos membuat biskut ini telah meningkat sebanyak 40% dari tahun 2006 ke tahun 2010.*

Calculate

*Hitungkan*

- (i) the composite index for the cost of making these biscuits in the year 2008 based on the year 2006,

*indeks gubahan bagi kos membuat biskut itu pada tahun 2008 berdasarkan tahun 2006,*

- (ii) the price of a box of these biscuits in the year 2010 if its corresponding price in the year 2006 is RM25.

*harga sekotak biskut ini pada tahun 2010 jika harganya pada tahun 2006 ialah RM25.*

[5marks]

[5 markah]

14. Use graph paper to answer this question.

*Gunakan kertas graf untuk menjawab soalan ini.*

A company intends to send workers to attend two types of computer courses, A and B. The number of participants for course A is  $x$  and for course B is  $y$ . The fees for attending course A and course B are RM 500 and RM 400 respectively.

*Sebuah syarikat ingin menghantar pekerjaanya untuk menyertai dua jenis kursus komputer, A dan B. Bilangan peserta untuk kursus A ialah  $x$  dan untuk kursus B ialah  $y$ . Yuran penyertaan kursus A dan kursus B adalah RM 500 dan RM 400 masing-masing.*

The selection of the participants is based on the following constraints:

*Pemilihan peserta adalah berdasarkan kekangan berikut:*

- I : The total number of participants is at least 50.  
*Jumlah peserta adalah sekurang-kurangnya 50.*
- II : The number of participants for course B is not more than three times the number of participants for course A  
*Bilangan peserta kursus B tidak melebihi tiga kali bilangan peserta kursus A.*
- III : The maximum allocation for the courses is RM 36 000.  
*Peruntukan maksimum bagi kedua-dua kursus adalah RM 36 000.*
- (a) Write three inequalities, other than  $x \geq 0$  and  $y \geq 0$ , which satisfy all the above constraints. [3 marks]  
*Tulis tiga ketaksamaan, selain  $x \geq 0$  dan  $y \geq 0$ , yang memenuhi semua kekangan di atas.* [3 markah]
- (b) Using a scale of 2 cm to 10 participants on both axes, construct and shade the region R which satisfies all of the above constraints. [3 marks]  
*Menggunakan skala 2 cm kepada 10 peserta pada kedua-dua paksi, bina dan lorek rantau R yang memenuhi semua kekangan di atas.* [3 markah]
- (c) Use your graph in 14(b), to find  
*Gunakan graf anda di 14(b), untuk mencari*
  - (i) the maximum number of participants of course A if the number of participants of course B is 55.  
*bilangan maksimum peserta kursus A jika bilangan peserta kursus B ialah 55*
  - (ii) the minimum allocation for the courses.  
*peruntukan minimum untuk kedua-dua kursus.*

[4 marks]

[4 markah]

15. A particle moves along a straight line and passes through a fixed point  $O$ . Its velocity,  $v \text{ ms}^{-1}$ , is given by  $v = t^2 - 10t + 24$ , where  $t$  is the time, in seconds, after passing through  $O$ .

*Suatu zarah bergerak di sepanjang suatu garis lurus melalui satu titik tetap  $O$ . Halaju zarah itu,  $v \text{ ms}^{-1}$ , diberi oleh  $v = t^2 - 10t + 24$ , dengan keadaan  $t$  ialah masa, dalam saat selepas melalui  $O$ .*

[Assume motion to the right is positive].

*[Anggapkan gerakan ke arah kanan sebagai positif]*

Find

*Cari*

- |                                                                                 |            |
|---------------------------------------------------------------------------------|------------|
| (a) the initial velocity, in $\text{ms}^{-1}$ .                                 | [1 mark]   |
| <i>halaju awal, dalam <math>\text{ms}^{-1}</math>.</i>                          | [1 markah] |
| (b) the minimum velocity, in $\text{ms}^{-1}$ .                                 | [3 marks]  |
| <i>halaju minimum, dalam <math>\text{ms}^{-1}</math>.</i>                       | [3 markah] |
| (c) the range of $t$ during which the particle moves to the left.               | [2 marks]  |
| <i>julat nilai <math>t</math> ketika zarah bergerak ke arah kiri.</i>           | [2 markah] |
| (d) The total distance, in m, travelled by the particle in the first 5 seconds. |            |
| <i>Jumlah jarak, dalam m, yang dilalui oleh zarah dalam 5 saat pertama.</i>     | [4 marks]  |
|                                                                                 | [4 markah] |

**END OF QUESTION PAPER**  
**KERTAS SOALAN TAMAT**

**THE UPPER TAIL PROBABILITY  $Q(z)$  FOR THE NORMAL DISTRIBUTION  $N(0,1)$**   
**KEBARANGKALIAN Hujung Atas  $Q(z)$  BAGI TABURAN NORMAL  $N(0, 1)$**

| $z$ | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | Minus / Tolak |   |    |    |    |    |    |    |    |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------------|---|----|----|----|----|----|----|----|
| 0.0 | 0.5000 | 0.4960 | 0.4920 | 0.4880 | 0.4840 | 0.4801 | 0.4761 | 0.4721 | 0.4681 | 0.4641 | 4             | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 |
| 0.1 | 0.4602 | 0.4562 | 0.4522 | 0.4483 | 0.4443 | 0.4404 | 0.4364 | 0.4325 | 0.4286 | 0.4247 | 4             | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 |
| 0.2 | 0.4207 | 0.4168 | 0.4129 | 0.4090 | 0.4052 | 0.4013 | 0.3974 | 0.3936 | 0.3897 | 0.3859 | 4             | 8 | 12 | 15 | 19 | 23 | 27 | 31 | 35 |
| 0.3 | 0.3821 | 0.3783 | 0.3745 | 0.3707 | 0.3669 | 0.3632 | 0.3594 | 0.3557 | 0.3520 | 0.3483 | 4             | 7 | 11 | 15 | 19 | 22 | 26 | 30 | 34 |
| 0.4 | 0.3446 | 0.3409 | 0.3372 | 0.3336 | 0.3300 | 0.3264 | 0.3228 | 0.3192 | 0.3156 | 0.3121 | 4             | 7 | 11 | 15 | 18 | 22 | 25 | 29 | 32 |
| 0.5 | 0.3085 | 0.3050 | 0.3015 | 0.2981 | 0.2946 | 0.2912 | 0.2877 | 0.2843 | 0.2810 | 0.2776 | 3             | 7 | 10 | 14 | 17 | 20 | 24 | 27 | 31 |
| 0.6 | 0.2743 | 0.2709 | 0.2676 | 0.2643 | 0.2611 | 0.2578 | 0.2546 | 0.2514 | 0.2483 | 0.2451 | 3             | 7 | 10 | 13 | 16 | 19 | 23 | 26 | 29 |
| 0.7 | 0.2420 | 0.2389 | 0.2358 | 0.2327 | 0.2296 | 0.2266 | 0.2236 | 0.2206 | 0.2177 | 0.2148 | 3             | 6 | 9  | 12 | 15 | 18 | 21 | 24 | 27 |
| 0.8 | 0.2119 | 0.2090 | 0.2061 | 0.2033 | 0.2005 | 0.1977 | 0.1949 | 0.1922 | 0.1894 | 0.1867 | 3             | 5 | 8  | 11 | 14 | 16 | 19 | 22 | 25 |
| 0.9 | 0.1841 | 0.1814 | 0.1788 | 0.1762 | 0.1736 | 0.1711 | 0.1685 | 0.1660 | 0.1635 | 0.1611 | 3             | 5 | 8  | 10 | 13 | 15 | 18 | 20 | 23 |
| 1.0 | 0.1587 | 0.1562 | 0.1539 | 0.1515 | 0.1492 | 0.1469 | 0.1446 | 0.1423 | 0.1401 | 0.1379 | 2             | 5 | 7  | 9  | 12 | 14 | 16 | 19 | 21 |
| 1.1 | 0.1357 | 0.1335 | 0.1314 | 0.1292 | 0.1271 | 0.1251 | 0.1230 | 0.1210 | 0.1190 | 0.1170 | 2             | 4 | 6  | 8  | 10 | 12 | 14 | 16 | 18 |
| 1.2 | 0.1151 | 0.1131 | 0.1112 | 0.1093 | 0.1075 | 0.1056 | 0.1038 | 0.1020 | 0.1003 | 0.0985 | 2             | 4 | 6  | 7  | 9  | 11 | 13 | 15 | 17 |
| 1.3 | 0.0968 | 0.0951 | 0.0934 | 0.0918 | 0.0901 | 0.0885 | 0.0869 | 0.0853 | 0.083  |        |               |   |    |    |    |    |    |    |    |