For examiner's use only

Answer **all** questions.

*Jawab **semua** soalan.*

1

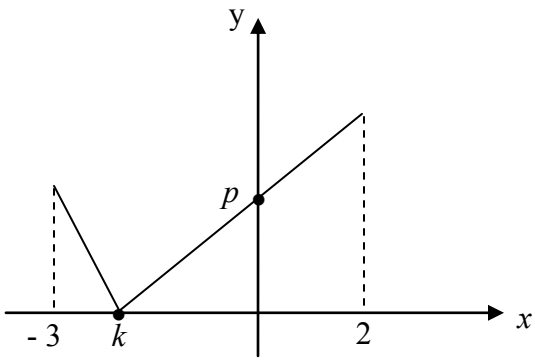

Diagram 1 / *Rajah 1*

Diagram 1 shows the graph of the function $g(x) = |2x + 3|$, for the domain $-3 \le x \le 2$.
Rajah 1 menunjukkan graf bagi fungsi $g(x) = |2x + 3|$, *untuk domain* $-3 \le x \le 2$.
State / *Nyatakan*

(*a*) the value of *k*
nilai k

(*b*) the value of *p*
nilai p

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

Answer / *Jawapan* :

(a)

(b)

1

2 Given the function $f^{-1}(x) = \frac{2-x}{3}$, find the value of q if $f(1) = q$.

Diberi fungsi $f^{-1}(x) = \frac{2-x}{3}$, *cari nilai q jika* $f(1) = q$.

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

Answer / *Jawapan* :

2

2

---

3 Given that m and n are the roots of the quadratic equation $x^2 + 2x - 15 = 0$, form the quadratic equation that has the roots $\frac{1}{m}$ and $\frac{1}{n}$ [3 *marks*]

Diberi m dan n adalah punca-punca persamaan kuadratik $x^2 + 2x - 15 = 0$, *bentukkan persamaan kuadratik yang mempunyai punca-punca* $\frac{1}{m}$ *dan* $\frac{1}{n}$. [3 *markah*]

Answer / *Jawapan* :

3

3

For examiner's use only

4 Find the range of values of p if the curve $f(x) = p(x^2 + 1) - 6x$ intersects the x-axis at two points. [3 *marks*]
Cari julat nilai p jika lengkung $f(x) = p(x^2 + 1) - 6x$ *menyilang paksi-x pada dua titik.* [3 *markah*]

Answer / *Jawapan* :

4
3

---

5 Diagram 5 shows the graph of the function $y = (x - p)^2 - 3$, where p is a constant.
Rajah 5 menunjukkan graf bagi fungsi $y = (x - p)^2 - 3$, *dengan keadaan p adalah pemalar.*

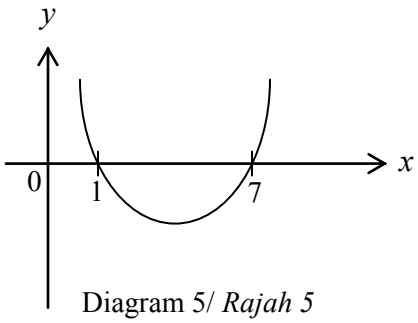

Diagram 5/ *Rajah 5*

Find
Cari
(a) the value of p
nilai p
(b) the equation of axis of symmetry
persamaan paksi simetri
(c) the coordinates of the minimum point [3 *marks*]
koordinat titik minimum. [3 *markah*]

Answer / *Jawapan* :

(a)

(b)

(c)

5
3

For examiner's use only

6 Solve the equation : $\sqrt{27^{x+2}} = \frac{1}{9^{1-x}}$ [3 *marks*]

Selesaikan persamaan : $\sqrt{27^{x+2}} = \frac{1}{9^{1-x}}$ [3 *markah*]

Answer / *Jawapan*:

6

3

7 Solve the equation $\log_2 2p - \log_2(1-3p) = 1$. [3 *marks*]

Selesaikan persamaan $\log_2 2p - \log_2(1-3p) = 1$. [3 *markah*]

Answer / *Jawapan* :

7

3

For examiner's use only

8 The sum of the first *n* terms of an arithmetic progression is given by $S_n = 3n + n^2$.

Hasil tambah n sebutan pertama bagi suatu janjang aritmetik diberi oleh $S_n = 3n + n^2$.

Find
Cari

(a) the first term
sebutan pertama

(b) common difference
beza sepunya

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

Answer / *Jawapan* :

(a)

(b)

8

3

---

9 The fourth term of a geometric progression is 8.The sum of the fourth term and the fifth term is 12.Find
Sebutan keempat suatu janjang geometri ialah 8.*Hasil tambah sebutan keempat dan sebutan kelima ialah* 12.*Cari*

(a) the first term and the common ratio of the progression.
sebutan pertama dan nisbah sepunya janjang itu.

(b) the sum to infinity of the progression.
hasil tambah hingga ketakterhinggan janjang itu.

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

Answer / *Jawapan* :

9

4

10 Diagram 10 shows parts of the graph of $\frac{1}{y}$ against x . The variables x and y are related by the equation $\frac{x}{y} = -px^2 + \frac{x}{q}$, where $p$and q are constant.

Rajah 10 *menunjukkan sebahagian graf* $\frac{1}{y}$ *melawan* x. *Pembolehubah* x *dan* y *dihubungkan oleh persamaan* $\frac{x}{y} = -px^2 + \frac{x}{q}$, *dengan keadaan* p *dan* q *adalah pemalar.*

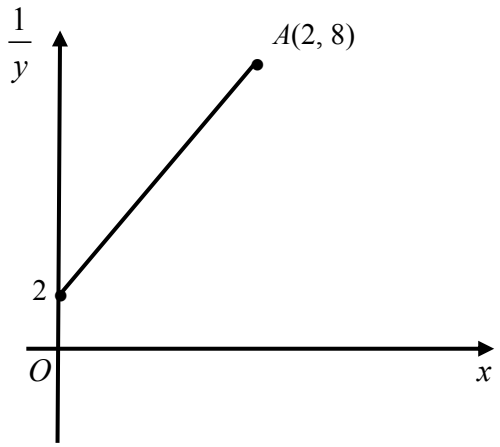

Diagram 10 / *Rajah* 10

Calculate the value of p and of q.

Hitung nilai p *dan nilai* q.

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

Answer / *Jawapan* :

10

3

For examiner's use only

11 Given that equation of a straight line $3y = (k - 2)x + 5$ with gradient -2 and passes through point $(1, h)$. Find the value of k and of h. [3 *marks*]

Diberi suatu persamaan garis lurus $3y = (k - 2)x + 5$ *dengan kecerunan* -2 *dan melalui titik* $(1, h)$. *Cari nilai k dan nilai h.* [3 *markah*]

Answer / *Jawapan* :

11

3

12 Table 12 shows the score obtained by a group of 40 students in a quiz competition.

Jadual 12 *menunjukkan markah yang diperolehi sekumpulan* 40 *orang pelajar dalam suatu pertandingan kuiz.*

Score *Skor*	1 - 10	11 - 20	21 - 30	31 - 40	41 - 50
Number of students *Bilangan pelajar*	7	8	9	10	6

Table 12 / *Jadual* 12

Calculate the first quartile of the data. [3 *marks*]

Hitung kuartil pertama bagi data itu. [3 *markah*]

Answer / *Jawapan* :

12

3

13 The following information refers to the vectors $\underset{\sim}{u}$ and $\underset{\sim}{v}$.

Maklumat berikut adalah berkaitan dengan vektor $\underset{\sim}{u}$ dan $\underset{\sim}{v}$.

$$\underset{\sim}{u} = \begin{pmatrix} 12 \\ 6 \end{pmatrix}, \ \underset{\sim}{v} = \begin{pmatrix} m-2 \\ 2 \end{pmatrix},$$

It is given that $\underset{\sim}{u} = k\underset{\sim}{v}$, where $\underset{\sim}{u}$ is parallel to $\underset{\sim}{v}$ and k is a constant

Diberi bahawa $\underset{\sim}{u} = k\underset{\sim}{v}$, *dengan keadaan* $\underset{\sim}{u}$ *selari dengan* $\underset{\sim}{v}$ *dan k ialah pemalar.*

Find the value of

Cari nilai

(a) k

(b) m [3 *marks*]

[3 *markah*]

Answer / *Jawapan*:

(a)

(b)

13

3

For examiner's use only

14 The following information refers to the vectors $\underset{\sim}{a}$ and $\underset{\sim}{b}$.

Maklumat berikut adalah berkaitan dengan vektor $\underset{\sim}{a}$ *dan vektor* $\underset{\sim}{b}$.

$$\underset{\sim}{a} = 2\underset{\sim}{i} + 5\underset{\sim}{j}\ ,\ \underset{\sim}{b} = -2\underset{\sim}{i} + 9\underset{\sim}{j}$$

Find

Cari

(a) the vector $3\underset{\sim}{a} - \underset{\sim}{b}$

vektor $3\underset{\sim}{a} - \underset{\sim}{b}$

(b) the unit vector in the direction of $3\underset{\sim}{a} - \underset{\sim}{b}$

vektor unit dalam arah $3\underset{\sim}{a} - \underset{\sim}{b}$

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

Answer / *Jawapan*:

(a)

(b)

14 4

---

15 It is given that $\cos A = -\frac{12}{13}$ and $\sin B = \frac{3}{5}$ where A is the reflect angle and B is an obtuse angle.

Diberi $\cos A = -\frac{12}{13}$ *dan* $\sin B = \frac{3}{5}$ *dengan keadaan A ialah sudut refleks dan B ialah sudut cakah.*

Find

Cari

(a) sec A

sek A

(b) $\tan(A + B)$

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

Answer / *Jawapan*:

(a)

(b)

15 4

For examiner's use only

16 A four-digit number is to be formed from the digits **5, 6, 7, 8, 9** .

Suatau nombor empat digit hendak di bentuk daripada digit-digit **5, 6, 7, 8, 9.**

How many
Berapa banyak

(a) different numbers can be formed?
nombor yang berlainan yang dapat dibentuk?
(b) different odd numbers can be formed? [3 marks]
nombor ganjil yang berlainan yang dapat dibentuk? [3 *markah*]

Answer / *Jawapan*:

(a)

(b)

16

3

---

17 A table tennis team consists of 5 students which is to be chosen from 6 boys and 5 girls.
Satu pasukan ping pong terdiri daripada 5 *orang pelajar yang akan dipilih daripada* 6 *lelaki dan* 5 *perempuan.*

Find the number of different ways to form the team so that each team consists of
Cari bilangan cara yang berlainan untuk membentuk pasukan supaya setiap pasukan terdiri daripada

(a) 3 boys,
3 *lelaki*,
(b) not more than 2 girls. [3 marks]
tidak lebih daripada 2 perempuan. [3 *markah*]

Answer / *Jawapan*:

(a)

(b)

17

3

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18.

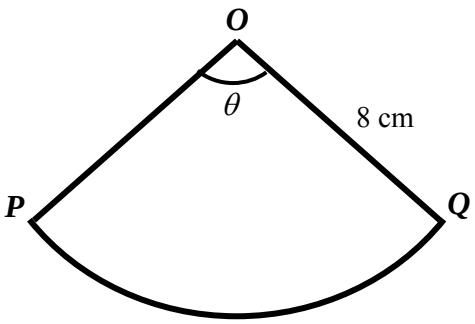


Diagram 18/ *Rajah* 18

Diagram 9 shows a sector *OPQ* with centre *O* and radius 8 cm. Given the area of the sector *OPQ* is 48 cm^2 .
Rajah 9 *menunjukkan sebuah sektor OPQ berpusat O dan berjejari* 8 cm*. Diberi luas sektor OPQ ialah* 48 cm^2

Find
cari

(a) the value of θ , in radian,
nilai θ*, dalam radian,*

(b) the length of arc *PQ*.
panjang lengkok PQ.

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

Answer / *Jawapan*:

(a)

(b)

For examiner's use only

19 Given $y = 5x(3x+12)$, find

Diberi $y = 5x(3x+12)$, *cari*

(a) $\frac{dy}{dx}$,

(b) the minimum value of *y*.
nilai minimum bagi y.

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

Answer / *Jawapan* :

(a)

(b)

19

3

20 Determine, in terms of *p*, the approximate change in the radius of the circle when the area of the circle increases from 784π to (784 + *p*)π, where *p* is small.

Tentukan, dalam sebutan p, anggaran perubahan dalam jejari bulatan apabila luas bulatan itu bertambah dari 784π ke (784 + *p*)π, *dengan keadaan p adalah kecil*.

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

Answer / *Jawapan* :

20

3

For examiner's use only

21 Given $y = \frac{3}{(2x+1)^2}$ and $\frac{dy}{dx} = 3g(x)$, where $g(x)$ is a function in x.

Find the value of $\int_{-1}^{1} g(x)dx$.

Diberi $y = \frac{3}{(2x+1)^2}$ *dan* $\frac{dy}{dx} = 3g(x)$, *dengan keadaan* $g(x)$ *adalah fungsi dalam* x.

Cari nilai bagi $\int_{-1}^{1} g(x)dx$. [3 *marks*]

[3 *markah*]

Answer / *Jawapan*:

21

3

---

22 Given the gradient function of a curve is $px - 3$, where p is constant. The curve has a turning point at $(6, -1)$.
Diberi fungsi kecerunan bagi suatu lengkung ialah $px - 3$, *dengan keadaan* p *adalah pemalar. Lengkung mempunyai titik pusingan pada* $(6, -1)$.
Find
Cari

(a) the value of p

nilai p

(b) the equation of curve

persamaan lengkung itu [4 *marks*]

[4 *markah*]

Answer/ *Jawapan :*

(a)

(b)

22

4

For examiner's use only

23 Amy takes the driving test until she passes the test. Each time Amy takes the test, the probability that she passes is 0.7.

Amy mengambil ujian memandu sehingga lulus ujian tersebut. Setiap kali Amy mengambil ujian,kebarangkalian dia lulus ialah 0.7.

Find the probability if
Cari kebarangkalian jika

(a) Amy passes only at the third attempt,
Amy lulus pada cubaan ketiga sahaja,

(b) Amy passes in either the first or the second attempt. [3 *marks*]
*Amy lulus samada kali pertama atau kedua cub*aan. [3 *markah*]

Answer/*Jawapan* :

(a)

(b)

23

3

---

24 A box contains 5 red cards and 3 green cards. A card is randomly picks from the box with replacement. If 8 trials, find the probability that the cards drawn are
Sebuah kotak mengandungi 5 keping kad merah dan 3 keping kad hijau. Sekeping kad dikeluarkan dengan pengembalian. Jika 8 percubaan dibuat, cari kebarangkalian bahawa kad yang dikeluarkan

(a) exactly 3 red cards,
tepat 3 kad berwarna merah,

(b) at least 2 green cards.
sekurang-kurangnya 2 keping kad hijau. [4 *marks*]
[4 *markah*]

Answer / *Jawapan*:

(a)

24

(b)

4

For examiner's use only

25 A random variable X has a normal distribution with a mean of μ and a standard deviation of 2.4.
Pembolehubah rawak X mempunyai taburan normal dengan min μ *dan sisihan piawai* 2.4.

Find,
Cari,

(a) the value of μ if the z –score is 3.5 when $x = 15$
nilai μ *jika skor-z nya ialah* 3.5 *apabila* $x = 15$

(b) $p(x \leq 7)$. [4 *marks*]
[*4 markah*]

Answer / *Jawapan* :

(a)

(b)

25

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

Section *A* / *Bahagian A*

[40 *marks* / 40 *markah*]

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

1 Solve the simultaneous equations $x - 2y = 4$ and $x^2 + xy = 30$.

Give your answers correct to three decimal places. [5 *marks*]

Selesaikan persamaan serentak $x - 2y = 4$ *dan* $x^2 + xy = 30$.

Berikan jawapan anda betul kepada tiga tempat perpuluhan. [5 *markah*]

2 Diagram 2 shows the curve of a quadratic function $f(x) = -2x^2 - px + 11$. The curve has a maximum point at $L(-1, h)$ and intersects the $f(x)$-axis at point K.

Rajah 2 *menunjukkan lengkung bagi fungsi kuadratik* $f(x) = -2x^2 - px + 11$. *Lengkung itu mempunyai titik maksimum pada* $L(-1, h)$ *dan memotong paksi-f(x) pada titik K.*

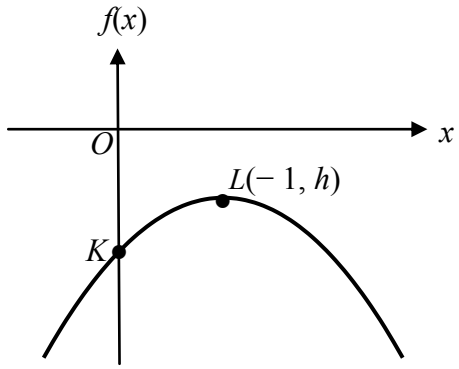


Diagram 2 / Rajah 2

(a) State the coordinates of K. [1 *marks*]

Nyatakan koordinat K. [3 *markah*]

(b) Express $f(x)$ in the form $a(x + m)^2 + n$, where a, m and n are constants, hence find the value of p and h. [3 *marks*]

Ungkapkan $f(x)$ *dalam bentuk* $a(x + m)^2 + n$, *dengan keadaan* a, m *dan* n *adalah pemalar*, *seterusnya cari nilai p dan h.* [3 *markah*]

(*c*) Determine the range of values of x for which $f(x) < 5$. [3 *marks*]

Tentukan julat nilai x bila $f(x) < 5$. [3 *markah*]

3 A set of scores, x_1, x_2, x_3, x_4, x_5 and x_6 has a mean of 4 and a standard deviation of 3.

Satu set skor, x_1, x_2, x_3, x_4, x_5 *dan* x_6 *mempunyai min* 4 *dan sisihan piawai* 3.

(a) Find

Cari

(i) Σx,

(ii) Σx^2.

[3 *marks*]

[3 *markah*]

(b) when a number k is added to this set, the new mean is 5.

Apabila satu nombor k ditambah kepada set ini, min baru ialah 5.

Find the value of k.

Cari nilai k.

[2 *marks*]

[2 *markah*]

(c) Each score is multiplied by 4 and then 3 is added to it. For the new set of scores, find

Setiap skor didarab 4 *dan kemudian ditambah* 3. *Untuk set skor yang baru*, *cari*

(i) the mean,

min,

(ii) the standard deviation.

sisihan piawai.

[3 *marks*]

[3 *markah*]

4 (*a*) Sketch the graph of $y = -\tan x$ for $0 < x \leq 2\pi$. [3 *marks*]

Lakarkan graf bagi $y = -\tan x$ *untuk* $0 < x \leq 2\pi$. [3 *markah*]

(*b*) By using the same axes, sketch a suitable straight line to find the number of solutions for the equation $2x + \pi \tan x = 0$ for $0 < x \leq 2\pi$. [3 *marks*]

Dengan menggunakan paksi yang sama, lakarkan satu garis lurus yang sesuai untuk mencari bilangan penyelesaian bagi persamaan $2x + \pi \tan x = 0$ *untuk* $0 < x \leq 2\pi$.

[3 *markah*]

5 A leak has been discovered in an underground main pipe in kampong Serada , Kuala Terengganu. The

quantity of water leaking for the first hour is 10 litre , 15 litre in the second hour, 20 litre in the third hour and continuously.

Satu kebocoran telah dikesan pada saluran paip utama di bawah tanah di kampong Serada, Kuala Terengganu. Kuantiti air yang telah mengalir ialah 10 *liter pada jam pertama*, 15 liter *pada jam kedua*, 20 *litre pada jam ketiga dan seterusnya.*

Calculate/ *Hitungkan*

(a) the quantity of water leaking in 20^{th} hour. [3 *marks*]

kuantiti air yang telah mengalir pada jam ke 20. , [3 *markah*]

(b) the number of time taken in hour if the total quantity of water leaking is 3510 litre.

[4 *marks*]

bilangan masa yang diambil dalam jam jika jumlah kuantiti air yang telah mengalir ialah 3510 *liter*.

[4 *markah*]

6 Diagram 6, shows two triangles *OAB* and *OAP*. The straight line *OP* intersects the straight line *AB* at point *R*.

Rajah 6, *menunjukkan dua buah segitiga OAB dan OAP. Garis lurus OP bersilang dengan garis lurus AB di R.*

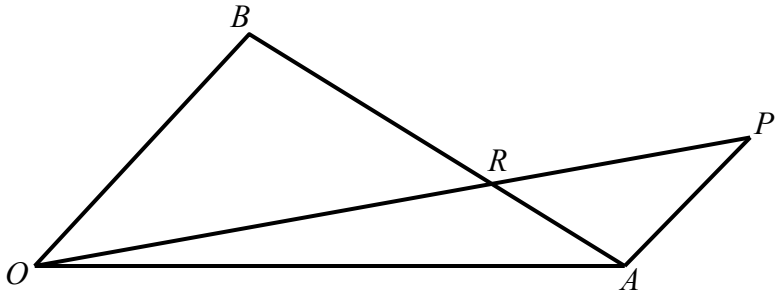


Diagram 6 / *Rajah* 6

Given that $\overrightarrow{OA} = 8\underset{\sim}{a}$, $\overrightarrow{OB} = 10\underset{\sim}{b}$ and $5\overrightarrow{AP} = 2\overrightarrow{OB}$

Diberi bahawa $\overrightarrow{OA} = 8\underset{\sim}{a}$, $\overrightarrow{OB} = 10\underset{\sim}{b}$ *dan* $5\overrightarrow{AP} = 2\overrightarrow{OB}$

(a) Express in terms of $\underset{\sim}{a}$ and / or $\underset{\sim}{b}$

Ungkapkan dalam sebutan $\underset{\sim}{a}$ *dan* / or $\underset{\sim}{b}$

(i) $\overrightarrow{BA}$ (ii) $\overrightarrow{OP}$

[3 *marks*]

[3 *markah*]

(b) It is given that $\overrightarrow{OR} = m\overrightarrow{OP}$ and $\overrightarrow{BR} = n\overrightarrow{BA}$, where *m* and *n* are constants. Express $\overrightarrow{OR}$

Diberi bahawa $\overrightarrow{OR} = m\overrightarrow{OP}$ dan $\overrightarrow{BR} = n\overrightarrow{BA}$, *dengan keadaan m dan n ialah pemalar.*

Ungkapkan $\overrightarrow{OR}$

(i) in terms of m, $\underset{\sim}{a}$ and $\underset{\sim}{b}$

dalam sebutan m, $\underset{\sim}{a}$ *dan* $\underset{\sim}{b}$

(ii) in terms of n, $\underset{\sim}{a}$ and $\underset{\sim}{b}$

dalam sebutan n, $\underset{\sim}{a}$ *dan* $\underset{\sim}{b}$

[3 *marks*]

[3 *markah*]

(c) Hence, find the value of *m* and of *n*.

Seterusnya, cari nilai m dan nilai n.

[2 *marks*]

[2 *markah*]

Section *B* / *Bahagian B*

[40 *marks* / 40 *markah*]

Answer **four** questions from this section.

Jawab **empat** *soalan daripada bahagian ini.*

7. Diagram 7 shows parts of the curve $y = \frac{8}{(3x+1)^2}$ which passes through $S(-1,2)$.

Rajah 7 *menunjukkan sebahagian lengkung* $y = \frac{8}{(3x+1)^2}$ *yang melalui* $S(-1,2)$.

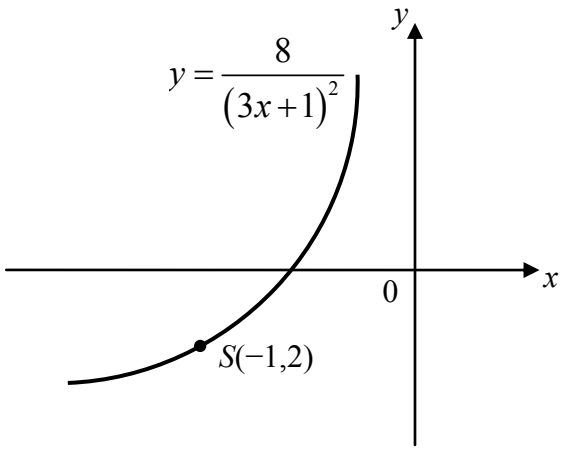


Diagram 7 / *Rajah* 7

(a) Find the equation of the normal to the curve at point $S(-1,2)$. [4 *marks*]

Cari persamaan normal kepada lengkung itu, pada titik $S(-1,2)$. [4 *markah*]

(b) A region is bounded by the curve, the x-axis and the straight line $x = -2$ and $x = -3$.

Suatu rantau dibatasi oleh lengkung itu, paksi-x, garis $x = -2$ *dan garis* $x = -3$.

(i) Find the area of the region

Carikan luas itu.

(ii) The region is revolved through $360°$ about the x-axis. Find the volume generated, in terms of π.

Rantau ini dikisarkan melalui $360°$ *pada paksi-x, carikan isipadu janaan, dalam sebutan* π.

[6 *marks*]

[6 *markah*]

8. Table 8 shows the values of two variables, x and y, obtained from an experiment. The variables x and y are selected by the equation $y = ux^{v-1}$, where u and v are constants.

Jadual 8 *menunjukkan nilai-nilai bagi dua pemboleh ubah, x dan y, yang diperoleh daripada satu eksperimen.Pemboleh ubah x dan y dihubungkan oleh persamaan* $y = ux^{v-1}$, *dengan keadaan u dan v adalah pemalar.*

x	3	4	5	6	7	8
y	11.5	14.3	17.6	21.4	24.3	27.5

Table 8 / *Jadual* 8

(a) Plot $\log_{10} y$ against $\log_{10} x$, using a scale of 2 cm to 0.1 unit on the $\log_{10} x$- axis and 2 cm to 0.2 cm on the $\log_{10} y$-axis.

Plot $\log_{10} y$ *melawan* $\log_{10} x$, *dengan menggunakan skala* 2 cm *kepada* 0.1 *unit pada paksi-*$\log_{10} x$ *dan* 2 cm *kepada* 0.2 cm *pada paksi-*$\log_{10} y$.

[5 *marks*]

[5 *markah*]

(b) Use your graph in (a) to find the value of

Gunakan graf anda di (a) untuk mencari nilai

(i) u

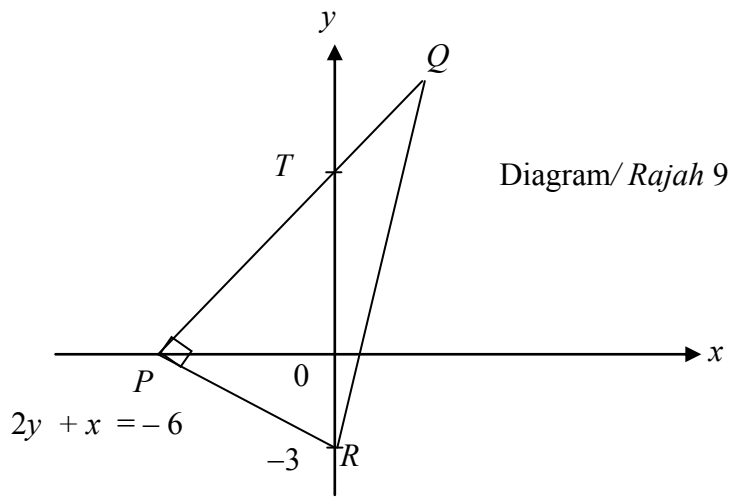
(ii) v [5 *marks*]

[5 *markah*]

9 Solution by scale drawing is not accepted.
Penyelesaian secara lukisan berskala tidak diterima.

Diagram 9 shows a triangle *PQR*.

Rajah 9 *menunjukkan sebuah segi tiga PQR.*



Diagram/ *Rajah* 9

The line *PQ* is perpendicular to the line *PR*. Point *P* lies on the *x*-axis and point *R* lies on the *y*-axis. The equation of *PR* is $2y + x = -6$.
Garis PQ adalah berserenjang dengan garis PR. Titik P terletak pada paksi-x dan titik R terletak pada paksi-y. Persamaan PR adalah $2y + x = -6$.

(*a*) Find the equation of the straight line *PQ*. [3 *marks*]
Cari persamaan garis lurus PQ. [3 *markah*]

(*b*) Given that *PT* : *TQ* = 2 : 1 and point *T* lies on the *y*-axis, find the coordinates of *Q*.
[2 *marks*]
Diberi PT : *TQ* = 2 : 1 *dan titik T terletak pada paksi-y, cari koordinat Q.*
[2 *markah*]

(*c*) Calculate the area of triangle *QRT*. [2 *marks*]
Hitung luas segi tiga QRT. [2 *markah*]

(*d*) Point $S(x, y)$ moves such that its distance from *P* is always twice its distance from *R*.
Find the equation of the locus of *S*. [3 *marks*]
Titik $S(x, y)$ *bergerak dengan keadaan jaraknya dari P adalah sentiasa dua kali ganda jaraknya dari R. Cari persamaan lokus bagi S.* [3 *markah*]

10 Diagram 10 shows a circle, with centre O.

Rajah 10 *menunjukkan sebuah bulatan berpusat* O.

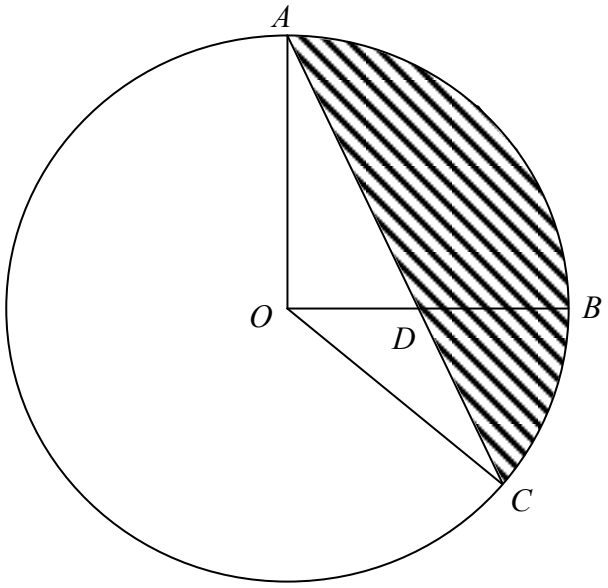


Diagram 10 / *Rajah* 10

Given that $\angle AOB = 90°$, $OA = 8$ cm and D is the midpoint of OB, find

Diberi bahawa $\angle AOB = 90°$, $OA = 8$ cm *dan* D *ialah titik tengah* OB, *cari*

[Use / *Guna* $\pi = 3{\cdot}142$]

(*a*) $\angle AOC$ in radians, [3 *marks*]
$\angle AOC$ *dalam radian*, [3 *markah*]

(*b*) the length, in cm, of major arc ABC, [3 *marks*]
panjang, *dalam* cm, *lengkok major* ABC, [3 *markah*]

(*c*) the area, in cm^2, of the shaded region. [4 *marks*]
luas, *dalam* cm^2, *kawasan berlorek*. [4 *markah*]

11 *(a)* In a survey, it was found that 35% from the graduates succeded in gaining employment after graduation.
Suatu tinjauan yang dijalankan, mendapati bahawa 35% daripada siswazah memperolehi pekerjaan selepas tamat pengajian.

If 8 graduates are chosen at random, find the probability that,
Jika 8 *orang siswazah dipilih secara rawak, cari kebarangkalian bahawa,*

(i) minimum 7 students are employed after graduation,
minimum 7 *orang siswazah memperolehi pekerjaan setelah tamat pengajian,*

(ii) maximum 2 of them are unemployed.
maksima 2 *orang tidak mendapat pekerjaan.*

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

(b) The mass of 2800 workers in the factory is normally distributed with mean 55 kg and standard deviation 16 kg.
Didapati bahawa jisim bagi 2800 *orang pekerja sebuah kilang bertabur secara normal dengan min* 55 *kg dan sisihan piawai* 16 *kg.*

Calculate,
Kira,

(i) how many workers whose mass is less then 70 kg,
berapa ramai pekerjakah yang beratnya kurang daripada 70 kg,

(ii) the value of m, if 18 % of the workers have a mass less than *m* kg.
Nilai m jika 18% *daripada pekerja beratnya kurang daripada m* kg.

[6 *marks*]
[6 *markah*]

Section C / Bahagian C

[20 *marks* / 20 *markah*]

Answer **two** questions from this section.

Jawab **dua** *soalan daripada bahagian ini.*

12. Table 12 shows the prices and the price indices for the four ingredients, *P*, *Q*, *R* and *S*, used in making sweets of a particular kind. Diagram 12 is a pie chart which represents the relative amount of the ingredients *P*, *Q*, *R* and *S*, used in making these sweets.

Jadual 12 *menunjukkan harga dan indeks harga empat bahan P, Q, R dan S yang digunakan untuk membuat sejenis gula-gula. Rajah* 12 *ialah carta pai yang mewakili kuantiti relatif bagi penggunaan bahan-bahan P, Q, R dan S itu.*

Ingredients *Bahan*	Price per kg (RM) *Harga se kg* (RM)		Price index for the year 2014 based on the year 2011 *Indeks harga tahun* 2014 *berasaskan tahun* 2011
	Year 2011 *Tahun* 2011	Year 2014 *Tahun* 2014	
P	1.50	1.80	*x*
Q	2·00	*y*	160
R	0·40	0·60	150
S	*z*	0·40	80

Table 12 / *Jadual* 12

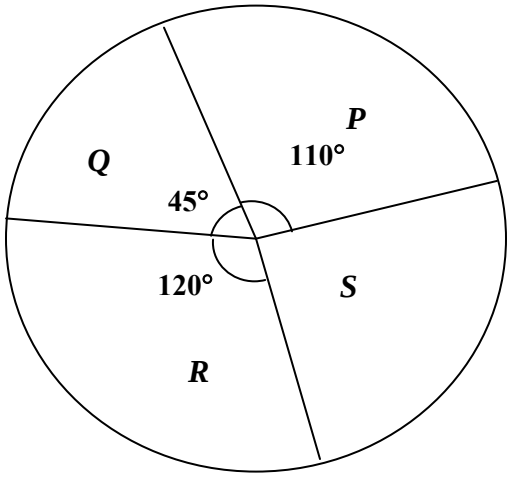


Diagram 12 / *Rajah* 12

(*a*) Find the value of *x*, *y* and *z*. [4 *marks*]

Cari nilai x, y dan z. [4 *markah*]

(*b*) (i) Calculate the composite index for the cost of making these sweets in the year 2014 based on the year 2011.
Hitung nombor indeks gubahan bagi kos membuat gula-gula itu pada tahun 2014 *berasaskan tahun* 2011.

(ii) Hence, calculate the corresponding cost of making these sweets in the year 2011 if the cost in the year 2014 was RM2985.
Seterusnya, *hitung kos membuat gula-gula itu yang sepadan bagi tahun* 2011 *jika kos membuatnya pada tahun* 2014 *ialah* RM2985.

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

(*c*) The cost of making these biscuits is expected to increase by 50% from the year 2014 to the year 2017. Find the expected composite index for the year 2017 based on the year 2011. [2 *marks*]
Kos membuat biskut itu dijangka meningkat sebanyak 50% *dari tahun* 2014 *ke tahun* 2017. *Cari nombor indeks gubahan kos membuat biskut itu yang dijangkakan pada tahun* 2017 *berasaskan tahun* 2011.

[2 *markah*]

13 Solution by scale drawing will not be accepted.

Penyelesaian secara lukisan berskala tidak diterima.

Diagram 13 shows ΔACD and ΔCDB .

Rajah 13 *menunjukkan* ΔACD *dan* ΔCDB .

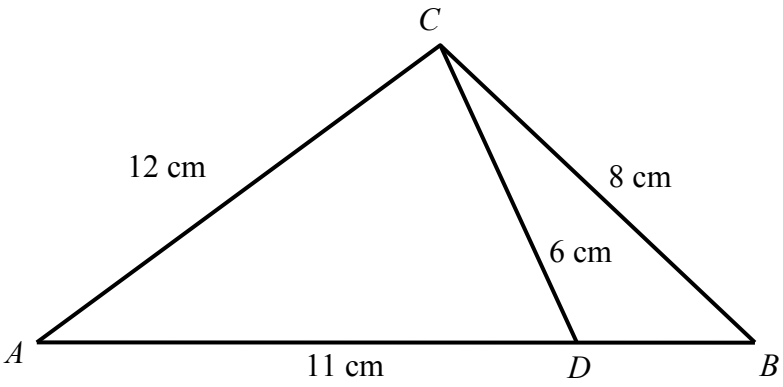


Diagram 13/ *Rajah* 13

It is given that $AC = 12$ cm, $AD = 11$ cm, $CD = 6$ cm and $CB = 8$ cm.

Diberi bahawa $AC = 12$ cm, $AD = 11$ cm, $CD = 6$ cm *dan* $CB = 8$ cm

.

(a) Find

Cari

(i) $\angle ADC$

(ii) $\angle ABC$

(iii) the area , in cm^2 of ΔABC

luas, dalam cm^2, *bagi* ΔABC [8 marks]

[8 *markah*]

(b) Point *B*' lies on *CB* such that *DB*' = *DB*,

Titik B' *terletak diatas CB dengan keadaan DB*' = *DB*.

(i) Sketch $\Delta CB'd$

Lakar $\Delta CB'd$

(ii) Find $\angle CB'D$

Cari $\angle CB'D$ [2 marks]

[2 *markah*]

14. Use graph paper to answer this question. /*Gunakan kertas graf untuk menjawab soalan ini.*

A tuiton centre offers tuition in Physics and Addational Mathematics. The number of students taking Physics is x and the number taking Additional Mathematics is y. The *enrolment of the students is based on the following conditions :*

Sebuah pusat tuisyen menawarkan subjek Fizik dan Matematik Tambahan. Bilangan pelajar bagi subjek Fizik ialah x orang dan bilangan pelajar bagi subjek Matematik Tambahan ialah y orang. Bilangan pelajar adalah berdasarkan kekangan yang berikut :

I : The total number of student is not more than 200.

Jumlah pelajar tidak melebihi 200.

II : The number of students taking Additional Mathematics is not more than three times the number of students taking Physics.

Bilangan pelajar subjek Matematik Tambahan tidak melebihi tiga kali bilangan pelajar subjek Fizik.

III : The number of students taking Additional Mathematics must exceed the number of students taking Physics by at least 10.

Bilangan pelajar subjek Matematik Tambahan mesti melebihi bilangan pelajar Fizik sekurang-kurangnya 10 orang.

(a) Write three inequalities, other than $x \geq 0$ and $y \geq 0$, which satisfy all the above constraints.

Tulis tiga ketaksamaan, selain $x \geq 0$ dan $y \geq 0$, *yang memenuhi semua kekangan di atas*.

[3 marks] / [3 *markah*]

(b) Using a scale of 2 cm to 20 students on both axes, construct and shaded the region R which satisfies all the above constraints.

Dengan menggunakan skala 20 cm *kepada* 20 *pelajar pada kedua-dua paksi, bina dan lorek rantau R yang memenuhi semua kekangan diatas*. [3 marks] / [3 *markah*]

(c) Using the graph from (b), find

Dengan menggunakan graf di (b), *cari*

(i) the range of number of students taking Additional Mathematics if 40 students enrolled for Physics.

julat pelajar Matematik Tambahan jika 40 *pelajar telah mendaftar untuk Fizik*.

[1 marks] / [1 *markah*]

(ii) the maximum total fees collected per month if the monthly fees per student for Physics and Additional Mathematics are RM 30 and RM 35 respectively.

jumlah maksimum kutipan yuran sebulan jika yuran sebulan bagi seorang pelajar Fizik dan Matematik Tambahan ialah RM 30 *dan* RM 35 *masing-masing*.

[3 marks] / [3 *markah*]

15 A particle moves in a straight line and passes through the fixed point O, with a velocity of $20\ \text{ms}^{-1}$. Its acceleration, $a\ \text{ms}^{-2}$, t s after passing through O is given $a = 8 - 2t$. The particle stops after z s.

Satu zarah bergerak pada satu garis lurus melalui satu titik tetap O, dengan halaju $20\ \text{ms}^{-1}$. *Pecutannya,* $a\ \text{ms}^{-2}$, t s *selepas melalui O ialah* $a = 8 - 2t$. *Zarah itu berhenti selepas z* s.

(a) Find

Cari

(i) the maximum velocity of the particle, [3 *marks*]

halaju maksimum zarah itu, [3 *markah*]

(ii) the value of z, [2 *marks*]

nilai z [2 *markah*]

(b) Sketch a velocity-time graph for $0 \le t \le z$ [2 *marks*]

Lakarkan graf halaju-masa untuk $0 \le t \le z$ [2 *markah*]

(c) Hence, calculate the total distance travelled during that period. [3 *marks*]

Seterusnya, hitungkan jumlah jarak yang dilalui dalam tempoh masa itu. [3 *markah*]

END OF QUESTION PAPER

KERTAS SOALAN TAMAT

BLANK PAGE / *HALAMAN KOSONG*

NAMA : ……..

TINGKATAN : ……..

Arahan Kepada Calon

1. Tulis Nama dan Tingkatan anda.
2. Tandakan (✓) untuk soalan yang dijawab.
3. Ceraikan helaian ini dan ikat sebagai muka hadapan bersama-sama dengan kertas jawapan.

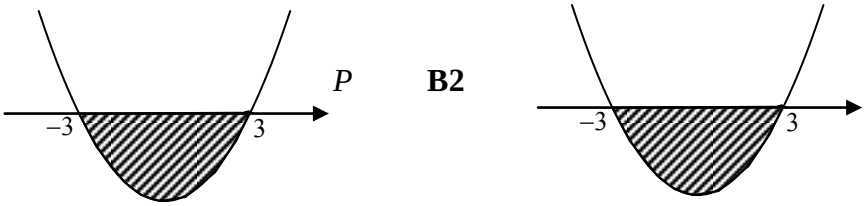
Bahagian	Soalan	Soalan Dijawab	Markah Penuh	Markah Diperoleh (*Untuk Kegunaan Pemeriksa*)
A	1		5	
	2		6	
	3		8	
	4		7	
	5		7	
	6		8	
B	7		10	
	8		10	
	9		10	
	10		10	
	11		10	
C	12		10	
	13		10	
	14		10	
	15		10	
Jumlah				

INFORMATION FOR CANDIDATES

MAKLUMAT UNTUK CALON

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**, any **four** questions from **Section B** and any **two** questions from **Section C**.
   Jawab **semua** *soalan dalam* ***Bahagian A***, mana-mana **empat** *soalan daripada* ***Bahagian B*** *dan* mana-mana **dua** *soalan daripada* ***Bahagian C***.
3. Write your answers on the foolscap papers provided.
   Tulis jawapan anda pada kertas jawapan yang disediakan.
4. Show your working. It may help you to get marks.
   Tunjukkan langkah-langkah penting dalam kerja mengira anda. Ia 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 dilukis 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 ceraian soalan ditunjukkan dalam kurungan.
7. A list of formulae is provided on pages 3 to 5.
   Satu senarai rumus disediakan di halaman 3 *hingga* 5.
8. Graph paper is provided.
   Kertas graf disediakan.
9. You may use a non-programmable scientific calculator.
   Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.
10. Tie the 'helaian tambahan' and the graph papers together with the answer sheets and hand in to the invigilator at the end of the examination.
    Ikatkan helaian tambahan dan kertas graf bersama-sama dengan kertas jawapan dan serahkan kepada pengawas peperiksaan pada akhir peperiksaan.

MARK SCHEME FOR ADDITIONAL MATHS. – BK 9
PAPER 1

No.	Mark Scheme	Σ Marks
1	(a) $-\frac{3}{2}$ **1** (b) 3 **1**	**2**
2	-1 **2** $f(x) = 2 - 3x$ atau $\frac{2-q}{3} = 1$ **B1**	**2**
3	$15x^2 - 2x - 1 = 0$ **atau** setara **3** $\frac{1}{m} + \frac{1}{n} = \frac{m+n}{mn} = \frac{2}{15}$ **atau** $\frac{1}{m}\left(\frac{1}{n}\right) = \frac{1}{mn} = -\frac{1}{15}$ **B2** $m + n = -2$ **dan** $m\,(n) = -15$ **B1**	**3**
4	$-3 < p < 3$ **3**  **B2** $(-6)^2 - 4(p)(p) > 0$ **B1**	**3**
5	(a) 4 **1** (b) x = 4 **1** (c) (4, -3) **1**	**3**
6	10 **3** $\frac{3}{2}(x+2) = -2(1-x)$ **B2** $3^{3(x+2)\frac{1}{2}} = 3^{-2(1-x)}$ **B1**	**3**

7	$p = \frac{1}{4}$ **3** $\frac{2p}{1-3p} = 2$ **B2** $\log_2\left(\frac{2p}{1-3p}\right) = 1$ **B1**	**3**
8	(a) 4 **1** (b) 2 **2** $6 - 4$ or $10 - 2(4)$ **B1** for using S_2 in $T_2 = S_2 - S_1$ or $S_2 - 2S_1$	**3**
9	(a) $a = 64$ and $r = \frac{1}{2}$ **2** $ar^3 = 8$ or $ar^3 + ar^4 = 12$ or $8 + 8r = 12$ **B1** (b) 128 **2** $\frac{64^*}{1-\frac{1^*}{2}}$ **B1** (* follow through from the value of a and r)	**4**
10	$p = -3$, $q = \frac{1}{2}$ (both) **(3)** $p = -3$ or $q = \frac{1}{2}$ **B2** $\frac{1}{y} = -px + \frac{1}{q}$ $m = 3$ or $c = 2$ **B1**	**3**

11	$k=-4$ dan $h=-\frac{1}{3}$	**3**	**3**
	$k=-4$ atau $h=-\frac{1}{3}$	**B2**	
	$\frac{k-2}{3}=-2$ atau $3h=(k-2)+5$	**B1**	
12	14.25	**3**	**3**
	$Q_1=10.5+\left(\frac{\frac{1}{4}(40)-7}{8}\right)10$	**B2**	
	L =10.5 or F =7 and f = 8	**B1**	
13	(a) $k = 3$	**1**	**3**
	(b) $m=6$	**2**	
	$3(m-2)=12$	**B1**	
14	(a) $8\underset{\sim}{i}+6\underset{\sim}{j}$ or $\begin{pmatrix}8\\6\end{pmatrix}$	**2**	**4**
	$3\begin{pmatrix}2\\5\end{pmatrix}-\begin{pmatrix}-2\\9\end{pmatrix}$ or $3(2\underset{\sim}{i}+5\underset{\sim}{j})-(-2\underset{\sim}{i}+9\underset{\sim}{j})$	**B1**	
	(b) $\frac{4\underset{\sim}{i}+3\underset{\sim}{j}}{5}$	**2**	
	$\sqrt{8^2+6^2}$ @ 10	**B1**	

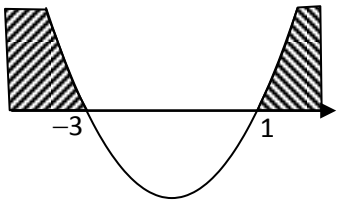
15	(a) $-\frac{13}{12}$ **2** $\frac{1}{\cos A}$ **B1** (b) $-\frac{16}{63}$ **2** $\frac{\frac{5}{12}+\left(-\frac{3}{4}\right)}{1-\frac{5}{12}\left(-\frac{3}{4}\right)}$ **B1**	**4**
16	(a) $^5P_4 = 120$ **1** (b) 72 **2** $^4P_3 \times {}^3P_1$ atau 4 x 3 x 2 x 3 **B1**	**3**
17	(a) $^6C_3 \times {}^5C_2 = 200$ **1** (b) 281 **2** $^6C_3 \times {}^5C_2 + {}^6C_4 \times {}^5C_1 + {}^6C_5 \times {}^5C_0$ **B1**	**3**
18	(a) $\theta = 1.5$ radian **2** $\frac{1}{2}(8)^2(\theta) = 48$ **B1** (b) 12 cm **2** 8(1.5) **B1**	**4**

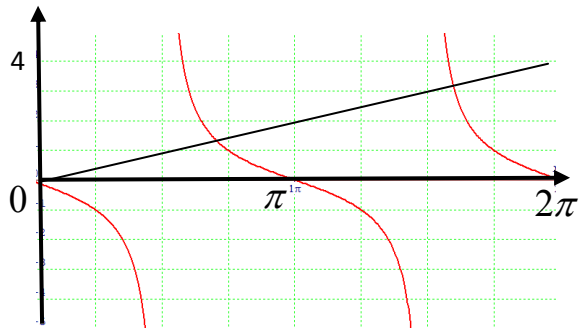
19	(a) $30x+60$ **1** (b) -60 **2** for $\frac{dy}{dx}=0$ @ $x=-2$ **B1**	**3**
20	$\frac{p}{56}$ **3** $\delta r=\frac{1}{2\pi(28)}\times p\pi$ **B2** $\frac{dA}{dr}=2\pi r$ or $r=28$ **B1**	**3**
21	$-\frac{8}{9}$ **3** $\left[\frac{1}{(2(1)+1)^2}\right]-\left[\frac{1}{(2(-1)+1)^2}\right]$ **B2** $\frac{1}{3}\left[\frac{3}{(2x+1)^2}\right]_{-1}^{1}$ **B1**	**3**
22	(a) $\frac{1}{2}$ **2** $p(6)-3=0$ **B1** (b) $y=\frac{x^2}{4}-3x+8$ **2** $y=\frac{x^2}{4}-3x+c$ **B1**	**4**
23	(a) 0.063 **1** (b) 0.91 **2** 0.7 + 0.7 x 0.3 **B1**	**3**

24	(a) 0.1014 **2** $^8C_3\left(\frac{5}{8}\right)^3\left(\frac{3}{8}\right)^5$ **B1** (b) 0.8649 // 0.8650 **2** $P(x \geq 2) = 1 - {}^8C_0\left(\frac{3}{8}\right)^0\left(\frac{5}{8}\right)^8 - {}^8C_1\left(\frac{3}{8}\right)^1\left(\frac{5}{8}\right)^7$ **B1**	**4**
25	(a) 6.6 **2** $3.5 = \frac{15-\mu}{2.4}$ **B1** (b) 0.5662 **2** $z \leq \frac{7-6.6^*}{2.4}$ **B1**	**4**

END OF MARK SCHEME

No	Penyelesaian & Markah		Jumlah Markah
1	$x = 4 + 2y$	**P1**	**5**
	$(4 + 2y)^2 + (4 + 2y)y = 30$	**K1**	
	$3y^2 + 10y - 7 = 0$		
	$y = \dfrac{-(10) \pm \sqrt{(10)^2 - 4(3)(-7)}}{2(3)}$	**KI**	
	$y = 0.594$, $y = -3.927$	**N1** (Kedua-dua)	
	$x = 5.188$, $x = -3.855$	**N1** (Kedua-dua)	
	ATAU		
	$y = \dfrac{x-4}{2}$	**P1**	
	$x^2 + x\left(\dfrac{x-4}{2}\right) = 30$	**K1**	
	$3x^2 - 4x - 60 = 0$		
	$x = \dfrac{-(-4) \pm \sqrt{(-4)^2 - 4(3)(-60)}}{2(3)}$	**K1**	
	$x = 5.188$, $x = -3.855$	**N1** (Kedua-dua)	
	$y = 0.594$, $y = -3.927$	**N1** (Kedua-dua)	

No.	Penyelesaian & Markah		Jumlah Markah
2	*(a)* $K(0, 11)$	**N1**	7
	(b) $f(x) = -2\left[\left(x+\frac{p}{4}\right)^2 - \frac{11}{2} - \left(\frac{p}{4}\right)^2\right]$	**K1**	
	$= -2\left(x+\frac{p}{4}\right)^2 + 11 + \frac{p^2}{8}$		
	$\left(-1+\frac{p}{4}\right) = 0, p = 4$	**N1**	
	$11 + \frac{4^2}{8} = h \quad , \quad h = 13$	**N1**	
	(c) $(x-1)(x+3) > 0$	**K1**	
		**K1**	
	$x < -3, \; x > 1$	**N1**	
3	*(a)* i) $\Sigma x = 24$	**N1**	7
	ii) $3 = \sqrt{\frac{\Sigma x^2}{6} - (4)^2}$	**K1**	
	$\Sigma x^2 = 150$	**N1**	
	(b) $5 = \frac{24+k}{7}$	**K1**	
	$k = 11$	**N1**	
	(c) i) 19	**N1**	
	ii) 12	**N1**	

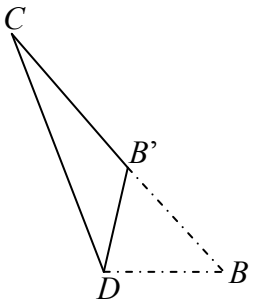
No.	Penyelesaian & Markah	Jumlah Markah
4	(*a*)  Bentuk (tan) **P1** Amplitud : 4 **P1** 1 kitaran dalam $0 < x \leq 2\pi$ **P1** (nyatakan sekurang- kurangnya 0 dan 2π) (*b*) $2x = -\pi \tan x$ $y = \frac{2x}{\pi}$ **N1** Lakar garis lurus (sama ada kecerunan atau pintasan-$y = 0$) **K1** Bilangan penyelesaian = 2 **N1**	6
5	(a) 10, 15, 20,…… $a = 10, \quad d = 5$ **P1** $T_{20} = 10 + (20 - 1)(5)$ **K1** $= 105$ liter **N1** (b) $S_n = \frac{n}{2}[2(10) + (n-1)5]$ **P1** $\frac{n}{2}[2(10) + (n-1)5] = 3510$ **K1** $5n^2 + 15n - 7020 = 0$ $(n + 39)(n - 36) = 0$ **K1** $n = 36$ **N1**	7

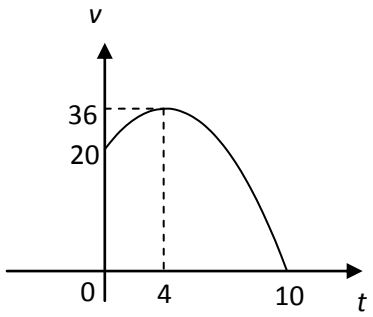
No.	Penyelesaian & Markah		Jumlah Markah
6	(a) (i) $8\underset{\sim}{a}-10\underset{\sim}{b}$ **N1**		8
	(ii) $\overrightarrow{OP}=\overrightarrow{OA}+\overrightarrow{AP}$ **K1**		
	$8\underset{\sim}{a}+4\underset{\sim}{b}$ **N1**		
	(b) (i) $m(8\underset{\sim}{a}+4\underset{\sim}{b})$ **N1**		
	(ii) $\overrightarrow{OR}=\overrightarrow{OB}+\overrightarrow{BR}$ **K1**		
	$10\underset{\sim}{b}+n(\overrightarrow{BA})$		
	$10\underset{\sim}{b}+n(-10\underset{\sim}{b}+8\underset{\sim}{a})$		
	$10(1-n)\underset{\sim}{b}+8n\underset{\sim}{a}$ **N1**		
	(c) $m(8\underset{\sim}{a}+4\underset{\sim}{b})=10(1-n)\underset{\sim}{b}+8n\underset{\sim}{a}$ **K1**		
	$m=\frac{5}{7}, n=\frac{5}{7}$ **N1**		
	BAHAGIAN B		
7	(a) $\frac{dy}{dx}=-\frac{48}{(3x+1)^3}$ **K1**		10
	Kec normal $=-\frac{1}{6}$ **K1**		
	$y-2=-\frac{1}{6}(x+1)$ **K1**		
	$6y+x-11=0$ atau Setara **N1**		

	bi) $\left[-\frac{8}{3(3x+1)}\right]_{-3}^{-2}$ **K1** $\left[\left(\frac{-8}{3(-6+1)}\right)-\left(\frac{-8}{3(-9+1)}\right)\right]_{-3}^{-2}$ **K1** $\frac{1}{5}$ **N1** bii) $\pi\left[\frac{-64}{9(3x+1)^3}\right]_{-3}^{-2}$ **K1** $\pi\left[\left(\frac{-64}{9(-5)^3}\right)-\left(\frac{-64}{9(-8)^3}\right)\right]$ **K1** $\frac{43}{1000}\pi$ **N1**	
8	**Rujuk lampiran graf**	

No.	Penyelesaian & Markah	Jumlah Markah
9	(a) $m = 2$ **K1** $y - 0 = 2(x - (-6))$ **K1** $y = 2x + 12$ **N1** (b) $\frac{2x-6}{3} = 0$ atau $\frac{2y+0}{3} = 12$ **K1** (3, 18) **N1** (c) Area of $\Delta = \frac{1}{2}\lvert -9 - 36 \rvert$ **K1** $= 22.5$ unit^2 **N1** (d) $\sqrt{(x+6)^2 + (y+0)^2}$ or $\sqrt{(x-0)^2 + (y+3)^2}$ **P1** $\sqrt{(x+6)^2 + (y+0)^2} = 2\sqrt{(x-0)^2 + (y+3)^2}$ **K1** $3x^2 + 3y^2 - 12x + 24y = 0$ **N1**	10
10	(*a*) $\tan \angle OAC = \frac{4}{8}$ **K1** $\angle OAC = 26{\cdot}57°$ $\angle AOC = 126{\cdot}86°$ **or** $126{\cdot}87°$ **P1** $= 2{\cdot}214$ rad **or** $2{\cdot}215$ rad **N1** (*b*) Length of arc $ABC = 8(4{\cdot}070)$ **or** $8(4{\cdot}069)$ **K1** 4.070 rad or 4.069 rad P1 $= 32{\cdot}56$ cm **or** $32{\cdot}55$ cm **N1** (*c*) Area of sector $OABC = \frac{1}{2}(8)^2(2{\cdot}214)$ **or** $\frac{1}{2}(8)^2(2{\cdot}215)$ **K1** Area of $\Delta OAC = \frac{1}{2}(8)^2 \sin 126{\cdot}86°$ **K1** Area of the shaded region $= \frac{1}{2}(8)^2(2{\cdot}214) - \frac{1}{2}(8)^2 \sin 126{\cdot}86°$ **K1** for subtraction $= 45{\cdot}25$ cm^2 **or** $45{\cdot}28$ cm^2 **N1**	10

No.	Penyelesaian & Markah	Jumlah Markah
11	*(a)* (i) ${}^8C_7(0.35)^7(0.65)^1 + {}^8C_8(0.35)^8(0.65)^0$ **K1** 0.00357 **N1** (ii) $P(X \le 2)$; $p = 0.65$ $q = 0.35$ **K1** ${}^8C_0(p)^0(q)^8 + {}^8C_1(p)^1(q)^7 + {}^8C_2(p)^2(q)^6$ **K1** 0.02532 **N1** *(b)* (i) $P\left(Z < \frac{70-55}{16}\right)$ **K1** 2625 **N1** (ii) $\frac{m-55}{16} = -0.915$ **P1** (- 0.915) **K1** $m = 40.36$ **N1**	10
12	(*a*) use $\frac{Q_{2011}}{Q_{2009}} \times 100$ **K1** $x =$ 120 **N1** $y =$ RM 0.85 **N1** $z =$ RM 2.20 **N1** (b) (i) $\bar{I} = \frac{(120)(110)+(160)(45)+(150)(120)+(80)(85)}{360}$ **K1** = 125.56 **N1** (ii) Corresponding expenditure 2011 = $\frac{2985}{125.56} \times 100$ **K1** = RM 2377.35 **N1** (c) $\frac{125.56}{\bar{I}} \times 150 = 100$ **K1** $\bar{I}_{17/11}$ = 188.34 **N1**	10

No.	Penyelesaian & Markah		Jumlah Markah
13	(a) (i) $12^2 = 11^2 + 6^2 - 2(8)(6)\text{Cos}\ \angle ADC$	**K1**	10
	$\angle ADC = 84.35^o$	**N1**	
	(ii) $\angle CDB = 95.65^o$ atau $\angle CAD = 29.84^o$	**P1**	
	$\frac{Sin\ \angle CBD}{6} = \frac{Sin\ 95.65}{8}$ atau $\frac{Sin\ \angle CBD}{12} = \frac{Sin\ 29.84}{8}$	**K1**	
	48.28^o	**N1**	
	(iii) Luas $\Delta ACD = \frac{1}{2}(11)(6)\,Sin\,84.35 = 32.84$		
	atau $\frac{1}{2}(11)(12)\,Sin\,29.84 = 32.84$	**K1**	
	atau Luas $\Delta CDB = \frac{1}{2}(8)(6)\,Sin\,35.79 = 14.04$		
	Luas ΔABC = Luas ΔACD + Luas ΔCDB	**K1**	
	$46.88\ \text{cm}^2$	**N1**	
	(b) 	**N1**	
	$\angle CB'D = 131.44^o$	**N1**	

14	(a) $x+y\le 200$ OR equivalent **N1** $y\le 3x$ OR equivalent **N1** $y-x\ge 10$ OR equivalent **N1** (b) Draw correctly at least one straight line **K1** Draw correctly all the three straight lines **K1** Region *R* shaded correctly **N1** (c) (i) $50\le y\le 120$ **N1** (ii) Maximum fee = $30x+35y$ Maximum point (50,150) **N1** = 30(50) + 35(150) **K1** = RM 6750 **N1**	10
15	(*a*) $v = \int(8-2t)dt = 8t-t^2+20$ (*i*) $8-2t=0$ (Using $a=0$) **K1** $v_{max} = 8(4)-(4)^2+20$ **K1** $= 36\ \text{ms}^{-1}$ **N1** (*ii*) $8t-t^2+20=0$ (Using $v=0$) **K1** $z = 10$ s **N1** (b)  **P1** (max shape) **N1** (max point and other two points) (c) $s = \int_0^{10}(8t-t^2+20)dt$ **K1** (integrate) $= \left[\frac{8t^2}{2}-\frac{t^3}{3}+20t\right]_0^{10}$ **K1** (using limit) $= 266\frac{2}{3}$ m **N1**	10