For examiner's use only

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

1 Diagram 1 shows a reciprocal graph $y = f(x)$ and two straight lines *AB* and *CD*. Point *P* lies on the graph.
Rajah 1 *menunjukkan graf salingan* $y = f(x)$ *dan dua garis lurus AB dan CD. Titik P terletak pada graf.*

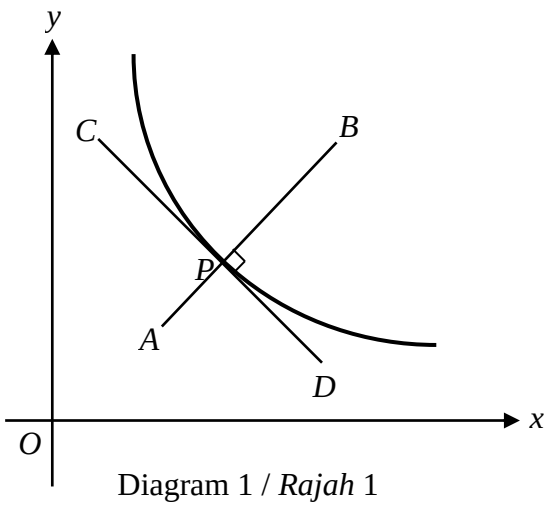

Diagram 1 / *Rajah* 1

State the straight line that satisfies the following conditions :
Nyatakan garis lurus manakah yang memenuhi syarat berikut :

(*a*) $\frac{dy}{dx} > 0$,
(*b*) tangen to the curve at point *P*,
tangen kepada lengkung pada titik P,
(*c*) normal to the curve at point *P*.
normal kepada lengkung pada titik P.

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

Answer/*Jawapan* :

(*a*)

(*b*)

(*c*)

1
3

For examiner's use only

2 Pak Man bought 540 m of steel wire to fence his land into three parts of equal rectangles, as shown in Diagram 2. Given the area of the three parts is A m^2.
Pak Man membeli 540 m *dawai besi untuk memagar tanahnya kepada tiga bahagian segi empat tepat yang sama seperti di dalam Rajah* 2. *Diberi luas tiga bahagian itu ialah* A m^2.

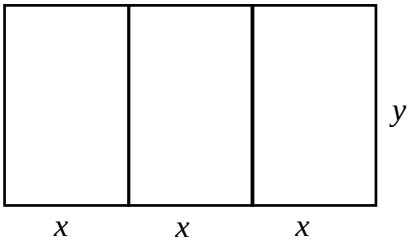

Diagram 2 / *Rajah* 2

(*a*) Express
Ungkapkan

(i) y in terms of x.
y dalam sebutan x.

(ii) A in terms of x.
A dalam sebutan x.

(*b*) Hence, find the value of x when the area of A is maximum.
Seterusnya, cari nilai bagi x apabila luas A adalah maksimum.

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

Answer/*Jawapan* :

(*a*)

(*b*)

2

4

For examiner's use only

3 Diagram 3 shows part of a curve.
Rajah 3 *menunjukkan sebahagian lengkung.*

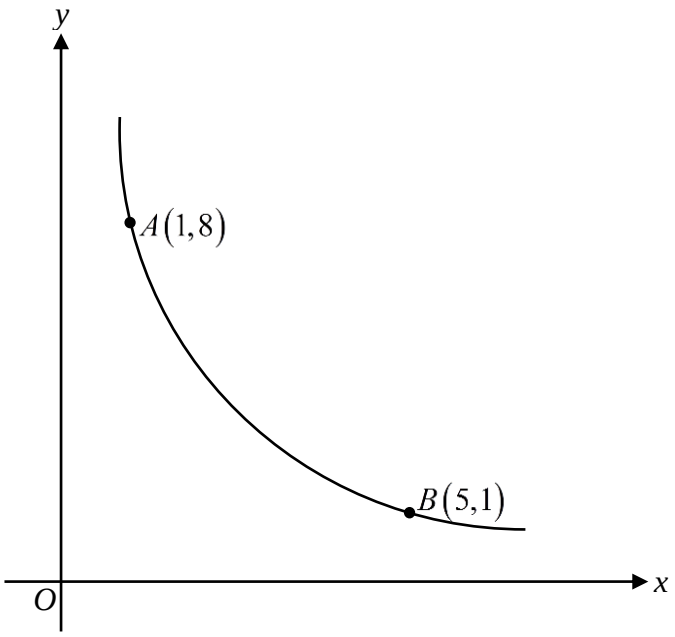

Diagram 3 / *Rajah* 3

Given that the points $A(1,8)$ and $B(5,1)$ lie on the curve and $\int_1^5 y\,dx = 18$,

find the value of $\int_1^8 x\,dy$.

Diberi bahawa titik $A(1,8)$ *dan* $B(5,1)$ *terletak pada lengkung itu dan* $\int_1^5 y\,dx = 18$,

cari nilai bagi $\int_1^8 x\,dy$.

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

Answer/*Jawapan* :

3

3

For examiner's use only

4 It is given that $\overrightarrow{OA} = m\underset{\sim}{i} + 2\underset{\sim}{j}$, $\overrightarrow{OB} = -\underset{\sim}{i} + 5\underset{\sim}{j}$ and $\overrightarrow{OC} = p\underset{\sim}{i} + 14\underset{\sim}{j}$ where *m* and *p* are constants. If *ABC* are collinear, express *p* in terms of *m*.

Diberi bahawa $\overrightarrow{OA} = m\underset{\sim}{i} + 2\underset{\sim}{j}$, $\overrightarrow{OB} = -\underset{\sim}{i} + 5\underset{\sim}{j}$ *dan* $\overrightarrow{OC} = p\underset{\sim}{i} + 14\underset{\sim}{j}$ *dengan keadaan m dan p adalah pemalar. Jika ABC adalah segaris, ungkapkan p dalam sebutan m.*

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

Answer/*Jawapan* :

4

3

For examiner's use only

5 Diagram 4 shows two vectors $\underset{\sim}{a}$ and $\underset{\sim}{b}$ on a Cartesian plane.

Rajah 4 *menunjukkan dua vektor* $\underset{\sim}{a}$ *dan* $\underset{\sim}{b}$ *pada suatu satah Cartesan.*

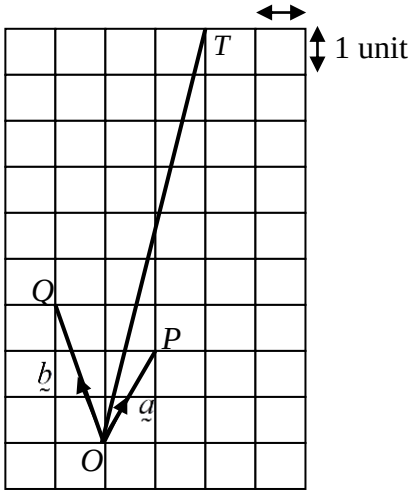

Diagram 4 / *Rajah* 4

Given that $\overrightarrow{OP} = \underset{\sim}{a}$ and $\overrightarrow{OQ} = \underset{\sim}{b}$. *Diberi bahawa* $\overrightarrow{OP} = \underset{\sim}{a}$ dan $\overrightarrow{OQ} = \underset{\sim}{b}$.

(*a*) Find
Cari

$$\left|\overrightarrow{OT}\right|$$

(*b*) Express the vector $\overrightarrow{OT}$ in terms of $\underset{\sim}{a}$ and $\underset{\sim}{b}$.

Ungkapkan vektor $\overrightarrow{OT}$ *dalam sebutan* $\underset{\sim}{a}$ *dan* $\underset{\sim}{b}$

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

Answer/*Jawapan* :

5

4

For examiner's use only

6 Solve the equation :
Selesaikan persamaan :

$$27^{x} \times 2^{3x} = 36$$

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

Answer/*Jawapan* :

6
3

7 Simplify
Ringkaskan

$$\frac{\log_m 2^3 - \log_m 3^6}{\log_m 2 - \log_m 9}$$

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

Answer/*Jawapan* :

7
3

For examiner's use only

8 Given $2\log_5 m - 3\log_5 n - \log_5 p + \log_5 q = 3$, express *p* in terms of *m,n* and *q*.

Diberi $2\log_5 m - 3\log_5 n - \log_5 p + \log_5 q = 3$ *, ungkapkan p dalam sebutan m, n dan q.*

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

Answer/*Jawapan* :

8
3

---

9 Ahmad's restaurant sells 'Teh Tarik' and gives choice to the customers whether to use sweetened creamer or evaporated creamer in their drinks. On a particular day the restaurant has 140 cans of sweetened creamer and 96 cans of evaporated creamer. Ahmad's restaurant used 5 cans of sweetened creamer and 3 cans of evaporated creamer in a day. After how many days, the remainder cans of both creamer are the same?

Restoran Ahmad menjual teh tarik dan memberikan pilihan kepada pelanggan-pelanggannya sama ada menggunakan susu pekat atau susu cair di dalam minuman mereka. Pada suatu hari tertentu restoran tersebut mempunyai 140 *tin susu pekat dan* 96 *tin susu cair. Restoran Ahmad menggunakan 5 tin susu pekat dan* 3 *tin susu cair dalam sehari. Selepas berapa harikah, bilangan baki tin bagi kedua-dua jenis susu itu adalah sama banyak?*

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

Answer/*Jawapan* :

9
3

For examiner's use only

10 The first three terms of a geometric progression are y, $(2x - 7)$ *and* $\left(\frac{x+1}{4}\right)$.

Given the common ratio is $\frac{1}{2}$.

Tiga sebutan pertama suatu janjang geometri ialah y, $(2x - 7)$ *dan* $\left(\frac{x+1}{4}\right)$.

Diberi nisbah sepunya ialah $\frac{1}{2}$.

(*a*) the value of x and of y.
nilai x dan nilai y.

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

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

Answer/*Jawapan* :

(*a*)

(*b*)

10

4

For examiner's use only

11 Diagram 11 shows the graph of $\log_2 y$ against $\log_2 x$. The variables x and y are related by the equation $y = px^3$, where p is a constants.

Rajah 11 *menunjukkan graf* $\log_2 y$ *melawan* $\log_2 x$. *Pembolehubah* x *dan* y *dihubungkan oleh persamaan* $y = px^3$ *dengan keadaan* p *adalah pemalar*.

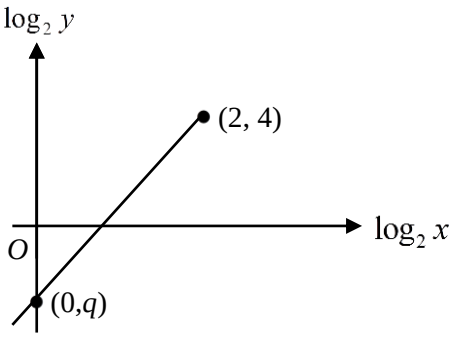

Diagram 11/ *Rajah* 11

Find the values of p and q.
Cari nilai p dan nilai q.

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

Answer/*Jawapan* :

11

3

For examiner's use only

12 Diagram 12 shows the tree diagram of Ani's family tree .
Rajah 12 *menunjukkan rajah pokok salasilah keluarga Ani.*

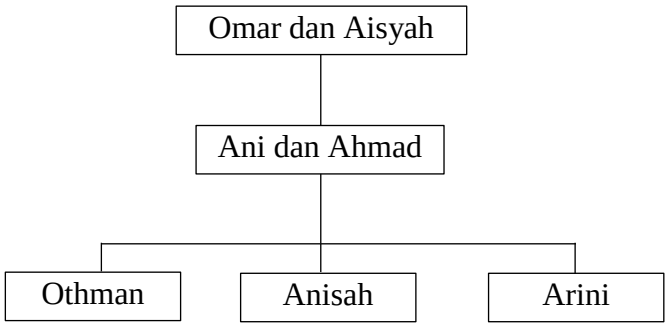

Diagram 12 / *Rajah* 12

(*a*) Represent the relation "father of" in the form of arrow diagram.
Wakilkan hubungan "bapa kepada" *itu dalam gambar rajah anak panah.*

(*b*) State the type of relation.
Nyatakan jenis hubungan itu .

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

Answer/*Jawapan* :

(*a*)

(*b*)

12

2

For examiner's use only

13 Given $f(x) = mx + 1$, where *m* is a constant. If $f^{-1}(k-1) = 8$, express *m* in terms of *k*.

Jika $f(x) = mx + 1$, *dengan keadaan m ialah pemalar. Jika.* $f^{-1}(k-1) = 8$, *ungkapkan m dalam sebutan k.*

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

Answer/*Jawapan* :

13

3

---

14 The equation $kx^2 - (h+1)x + 4k = 0$ has two equal roots.

Express *k* in terms of *h*, $k > 0$.

Persamaan $kx^2 - (h+1)x + 4k = 0$ *mempunyai dua punca yang sama.*

Ungkapkan k dalam sebutan h, $k > 0$.

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

Answer/*Jawapan* :

14

2

For examiner's use only

15 Diagram 15 shows the graph of a quadratic function $f(x) = a(x+p)^2 + q$.

Rajah 15 *menunjukkan graf fungsi kuadratik* $f(x) = a(x+p)^2 + q$.

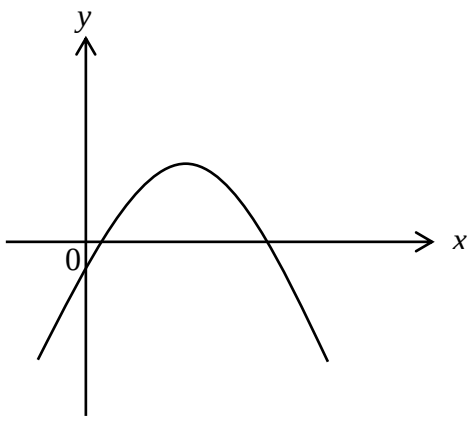

Diagram 15/ *Rajah* 15

Given the equation of the axis of symmetry is $x = 3$ and $y = 2$ is the tangent to the curve.
Diberi persamaan paksi simetri ialah $x = 3$ *dan* $y = 2$ *ialah tangen kepada lengkung itu.*

Find */Cari*

(*a*) the range of values of *a*,
julat nilai a,

(*b*) the value of *p* and of *q*.
nilai p dan nilai q.

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

Answer/*Jawapan* :

(*a*)

(*b*)

15

3

For examiner's use only

16 Solve the equation $4\sin x \text{ kos } x + 1 = 0$ for $0° \le x \le 360°$.
Selesaikan persamaan $4\sin x \text{ kos } x + 1 = 0$ *untuk* $0° \le x \le 360°$.

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

Answer/*Jawapan* :

16

3

---

17 It is given that $\sin x = k$, where k is a constant and $0° < x < 90°$.
Diberi bahawa $\sin x = k$, *dengan keadaan k ialah pemalar dan* $0° < x < 90°$.

Express in terms of k
Ungkapkan dalam sebutan k

(*a*) $\cos(180° - x)$,
$\text{kos}(180° - x)$,

(*b*) cosec $2x$.
kosek $2x$.

[4 marks]
[4 markah]

Answer/*Jawapan* :
(*a*)

(*b*)

17

4

For examiner's use only

18 Diagram 18 shows sector *OPQ* of a circle with centre *O*.
Rajah 18 *menunjukkan sektor OPQ bagi sebuah bulatan berpusat O.*

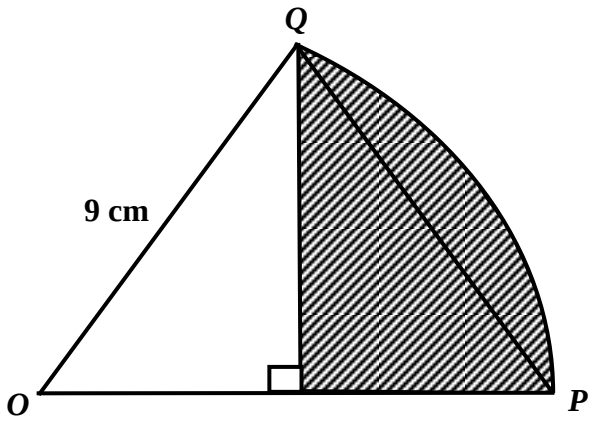

Diagram 18 / *Rajah* 18

Given *OP* = *PQ*, find the perimeter of the shaded region in terms of π.
Diberi OP = PQ, cari perimeter kawasan berlorek dalam sebutan π.

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

Answer/*Jawapan* :

18

4

For examiner's use only

19 The points $P(3h, -h)$, $Q(p, t)$ and $R(3p, 2t)$ are on a straight line. Q divides PR internally in the ratio 1 : 3. Express p in terms of t.
Titik-titik $P(3h, -h)$, $Q(p, t)$ dan $R(3p, 2t)$ terletak pada satu garis lurus. Q membahagi dalam PR dengan nisbah 1 : 3. *Ungkapkan p dalam sebutan t.*

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

Answer/*Jawapan* :

19
3

---

20 A set of data consists of 9, 6, 5, $x^2 - 2$ and 8. Given the mean is 7, find
Satu set data terdiri daripada 9, 6, 5, $x^2 - 2$ *dan* 8. *Diberi min ialah* 7, *cari*

(*a*) the positive value of x,
nilai positif bagi x,
(*b*) the varians using the value of x in (*a*).
varians menggunakan nilai x di (*a*).

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

Answer/*Jawapan* :
(*a*)

(*b*)

20
4

For examiner's use only

21 Table 21 shows the distribution of the scores obtained by 40 students in a quiz competition.
Jadual 21 *menunjukkan taburan markah yang diperolehi* 40 *pelajar dalam suatu pertandingan kuiz.*

Marks *Markah*	0	5	10	15	20
Number of students *Bilangan pelajar*	2	9	15	11	3

Table 21 / *Jadual* 21

Determine the interquartile range of the distribution.
Tentukan julat antara kuartil bagi taburan tersebut.

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

Answer/*Jawapan* :

21

3

For examiner's use only

22 Diagram 22 shows two fair dice is thrown together.
Rajah 22 *menunjukkan dua dadu adil dilambung serentak.*

Diagram 22 / *Rajah* 22

Find the probability that the digit on the dice
Cari kebarangkalian bahawa digit pada dadu itu

(*a*) have a sum of 8,
mempunyai hasil tambah 8,
(*b*) have at least one digit of '6'.
mempunyai sekurang-kurangnya satu digit '6'.

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

Answer/*Jawapan* :
(*a*)

(*b*)

22

3

For examiner's use only

23 Diagram 23 shows 5 male and 5 female players of a national badminton team.
Rajah 23 *menunjukkan* 5 *pemain lelaki dan* 5 *pemain perempuan bagi pasukan badminton sebuah negara*.

Diagram 23 / *Rajah* 23

Two mixed double is chosen from the team.
Dua bergu campuran dipilih dari pasukan itu.

(*a*) Find the number of ways the mixed double team can be formed.
Cari bilangan cara bergu campuran tersebut dapat dibentuk.

(*b*) Find the number of ways these two mixed doubles is arranged in a row with the two ends of the row must be male.
Cari bilangan cara dua bergu campuran itu disusun dalam satu baris dengan kedua-dua hujung barisan itu terdiri daripada pemain lelaki.

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

Answer/*Jawapan* :

(*a*)

(*b*)

23

4

For examiner's use only

24 8 % of the screws produced by factory A is defective. If 10 screws are randomly chosen, find the probability that
8 % *daripada skru yang dihasilkan oleh syarikat A adalah rosak. Jika* 10 *skru dipilih secara rawak, cari kebarangkalian bahawa*

(*a*) 2 screws are defective.
2 *skru adalah rosak.*

(*b*) none of the screws is defective.
tiada skru yang rosak.

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

Answer/*Jawapan* :

(*a*)

(*b*)

24

3

---

25 Given $Z \sim N(0,1)$ and $P(z_1 < Z < 1.4) = 0.1612$. Find $P(0 < Z < z_1)$.
Diberi $Z \sim N(0,1)$ *dan* $P(z_1 < Z < 1.4) = 0.1612$. *Cari* $P(0 < Z < z_1)$.

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

Answer/*Jawapan* :

25

3

Kertas Soalan Tamat

[*Lihat halaman sebelah*