

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

- 1 A function f relates x to $x^2 - 2x + 3$, by using function notation, it is written as
 $f: x \rightarrow x^2 - 2x + 3$.
 Suatu fungsi f menghubungkan x kepada $x^2 - 2x + 3$, ia ditulis dengan tatatanda fungsi f
 $: x \rightarrow x^2 - 2x + 3$.

- (a) How the function f is read?
 Bagaimana fungsi f ini dibaca?
 (b) Determine $f(z)$.
 Tentukan $f(z)$.

[2 marks]

[2 markah]

Answer / Jawapan :

(a)

(b)

1

2

- 2 Function m is defined as $m: x \rightarrow 2 - \frac{x}{3}$. If p is another function and pm is defined
 as $pm: x \rightarrow 5x - 7$, determine function p .

Fungsi m diberi sebagai $m: x \rightarrow 2 - \frac{x}{3}$. Jika p ialah suatu fungsi lain dan pm diberi
 sebagai $pm: x \rightarrow 5x - 7$, tentukan fungsi p .

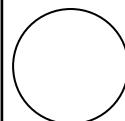
[3 marks]

[3 markah]

Answer / Jawapan :

2

3



- 3 The roots of the quadratic equation $2x^2 + 5x + 9 = 0$ are m and n . The roots for $px^2 - 3x + q = 0$ are $m + 2$ and $n + 2$. Find the value of p and of q .

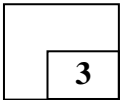
Punca-punca bagi persamaan kuadratik $2x^2 + 5x + 9 = 0$ adalah m dan n . Punca-punca bagi persamaan kuadratik $px^2 - 3x + q = 0$ adalah $m + 2$ dan $n + 2$. Carikan nilai p dan nilai q .

[3 marks]

[3 markah]

Answer / Jawapan :

3



- 4 The equation of the curve $y = px^2 - 4x + p - 3$ not intersects x -axis for $p < m$ and $p > n$.

Find the value of m and of n .

Persamaan lengkung $y = px^2 - 4x + p - 3$ tidak menyentuh paksi- x untuk $p < m$ dan

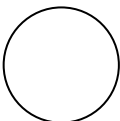
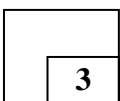
$p > n$. Cari nilai m dan nilai n .

[3 marks]

[3 markah]

Answer / Jawapan :

4



5 Solve the equation :

Selesaikan persamaan :

$$5(8^x) = 2(25^x)$$

[3 marks]

[3 markah]

Answer / Jawapan :

5

5
3

6 Given that $\log_y a = 2$, find

Diberi $\log_y a = 2$, cari,

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

(b) $\log_{\sqrt{y}} \frac{1}{a^2}$

[3 marks]

[3 markah]

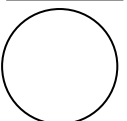
Answer / Jawapan :

(a)

(b)

6

6
3



- 7 It is given that x^2 , $5x$ and $7x - 4$ is the first three consecutive of an arithmetic progression. Find the value of x , where x is positive.

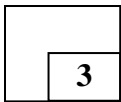
Diberi x^2 , $5x$ dan $7x - 4$ ialah tiga sebutan pertama bagi suatu jangjang aritmetik dengan keadaan x adalah positif. Cari nilai x .

[3 marks]

[3 markah]

Answer / Jawapan :

7



- 8 The following information refers to the sum of the terms of a geometric progression.

Maklumat berikut merujuk kepada hasil tambah sebutan-sebutan suatu jangjang geometri.

$$2.454545\dots\dots = 2 + 0.45 + k + 0.000045 + \dots$$

where k and m are constants
dengan keadaan k dan m ialah pemalar

- (a) Determine the value of k .

Tentukan nilai k .

- (b) Express the recurring decimal $2.454545\dots\dots$ as a fraction on its simplest form.

Ungkapkan perpuluhan berulang $2.454545\dots\dots$ sebagai pecahan dalam bentuk termudah.

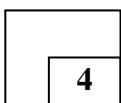
[4 marks]

[4 markah]

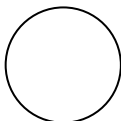
Answer / Jawapan :

(a)

8



(b)



9 Diagram 9 shows the graph of $\log_3 y$ against $\log_3 x$. Values of x and values

of y are related by the equation $y = \frac{x^{5p}}{q}$, where p and q are constants.

Rajah 9 menunjukkan graf $\log_3 y$ melawan $\log_3 x$. Nilai x dan nilai y dihubungkan oleh persamaan $y = \frac{x^{5p}}{q}$, dengan keadaan p dan q adalah pemalar.

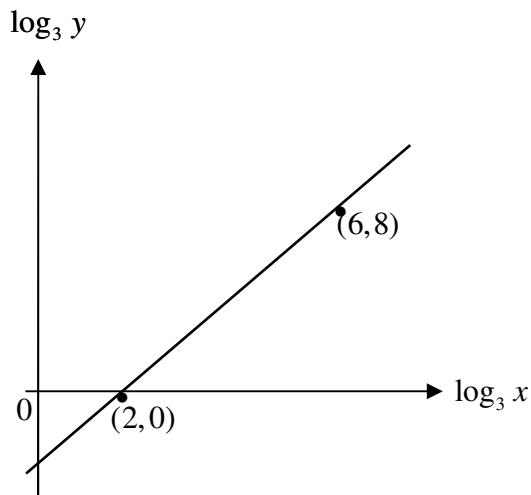


Diagram 9/ Rajah 9

(a) Express the equation $y = \frac{x^{5p}}{q}$ in its linear form used to obtain the straight line graph shown in diagram 9.

Ungkapkan persamaan $y = \frac{x^{5p}}{q}$ dalam bentuk linear yang digunakan untuk memperoleh graf garis lurus seperti ditunjukkan dalam rajah 9.

(b) Find the value of p and the value of q .

Carikan nilai p dan nilai q .

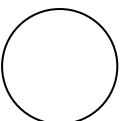
[4 marks]

[4 markah]

Answer / Jawapan :

9

4



- 10 Diagram 10 shows a bottle of liquid hand wash with based diameter 8 cm. The height of liquid inside the bottle is 22 cm.

Rajah 10 menunjukkan sebuah botol cecair pencuci tangan dengan diameter 8 cm. Tinggi cecair di dalam botol tersebut ialah 22 cm.



Diagram 10 / Rajah 10

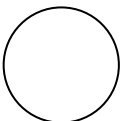
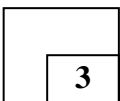
Find the small changes of the volume of the bottle, in terms of π , if the small error in diameter is 0.2 cm.

Cari perubahan kecil dalam isi padu botol, dalam sebutan π , jika ralat kecil bagi diameter ialah 0.2 cm.

[3 marks]
[3 markah]

Answer / Jawapan :

10



- 11 The gradient of the tangent to the curve $y = ax^2 + bx$ at the point $(1, 3)$ is 10. Find the value of a and of b .

Kecerunan tangen kepada lengkung $y = ax^2 + bx$ pada titik $(1, 3)$ ialah 10. Cari nilai bagi a dan bagi b .

[4 marks]

[4 markah]

Answer / Jawapan :

11

4

- 12 Given that $\int_2^6 g(x) dx = 8$, find

Diberi bahawa $\int_2^6 g(x) dx = 8$, cari

$$\int_2^3 g(x) dx - \int_6^3 [g(x) + 2x] dx$$

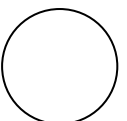
[4 marks]

[4 markah]

Answer / Jawapan :

12

4



13 Diagram 13 shows part of the graph $y = x^3 + 2$.

Rajah 13 menunjukkan sebahagian daripada graf $y = x^3 + 2$.

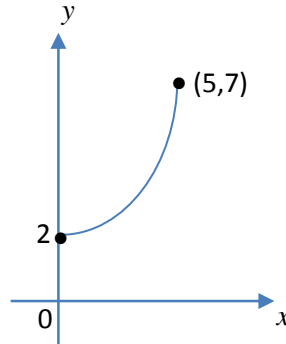


Diagram 13 / Rajah 13

(a) Using the diagram in the answer space provided shade the region of $\int_2^7 x \, dy$.

Dengan menggunakan rajah pada ruang jawapan, lorek rantau bagi $\int_2^7 x \, dy$.

(b) Hence, find $\int_0^5 y \, dx + \int_2^7 x \, dy$.

Seterusnya, cari nilai $\int_0^5 y \, dx + \int_2^7 x \, dy$.

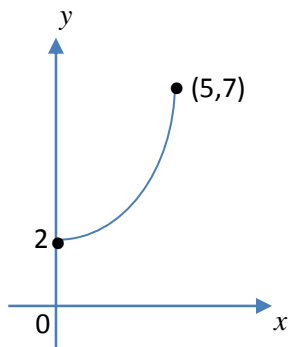
[3 marks]

[3 markah]

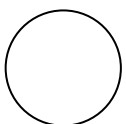
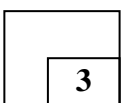
Answer / Jawapan :

(a)

(b)



13



- 14 Diagram 14 shows a straight line PR intersects perpendicularly to another straight line QS at point Q.

Rajah 14 menunjukkan satu garis lurus PR yang bersilang secara berserenjang dengan satu garis lurus lain, QS, pada titik Q.

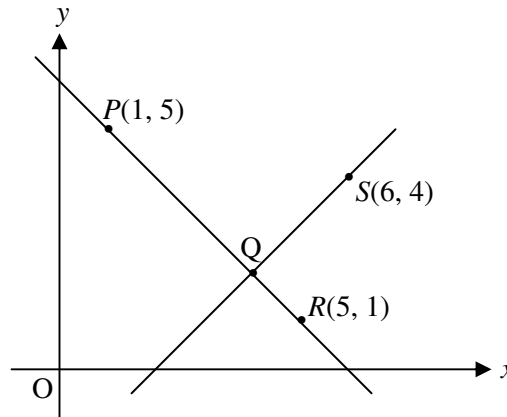


Diagram 14 / Rajah 14

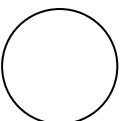
Find the coordinates of point Q.

Cari koordinat titik Q.

[4 marks]

[4 markah]

Answer / Jawapan :



15 Given $\overrightarrow{OU} = \begin{pmatrix} 4 \\ 7 \end{pmatrix}$ and $\overrightarrow{OV} = \begin{pmatrix} m \\ 2 \end{pmatrix}$, find

Diberi $\overrightarrow{OU} = \begin{pmatrix} 4 \\ 7 \end{pmatrix}$ dan $\overrightarrow{OV} = \begin{pmatrix} m \\ 2 \end{pmatrix}$, cari

(a) \overrightarrow{UV}

(b) the value of m such that \overrightarrow{UV} is parallel to the y-axis.

nilai m dengan keadaan \overrightarrow{UV} selari dengan paksi-y.

[4 marks]

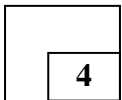
[4 markah]

Answer / Jawapan :

(a)

(b)

15



16 Given $\overrightarrow{RS} = \frac{1}{\sqrt{17}}(i + (4-k)j)$ is a unit vector in the direction of \overrightarrow{PQ} , find the value of k .

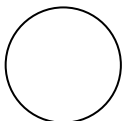
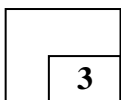
Diberi $\overrightarrow{RS} = \frac{1}{\sqrt{17}}(i + (4-k)j)$ ialah satu vektor unit dalam arah \overrightarrow{PQ} , cari nilai k .

[3 marks]

[3 markah]

Answer / Jawapan :

16



- 17 Diagram 17 shows a staircase with length 3.6 m, leans against a wall with height 3 m.

Rajah 17 menunjukkan sebuah tangga dengan panjang 3.6 m yang disandarkan pada dinding setinggi 3 m.



Diagram 17 / Rajah 17

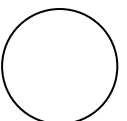
Solve the equation $\sin k = \frac{\cos y}{4\cos k}$, for $0^\circ \leq k \leq 360^\circ$

Selesaikan persamaan $\sin k = \frac{\cos y}{4\cos k}$, untuk $0^\circ \leq k \leq 360^\circ$

[4 marks]

[4 markah]

Answer / Jawapan :



18 Diagram 18 shows the position of a pendulum which swing from A to B.

Rajah 18 menunjukkan kedudukan suatu bandul ringkas yang berayun dari A ke B.

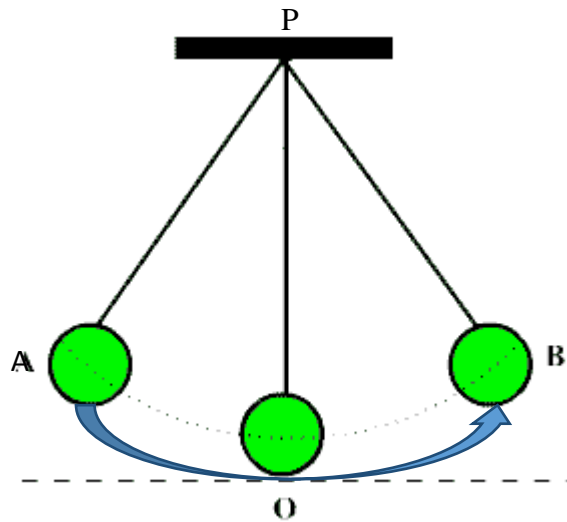


Diagram 18 / Rajah 18

If the $\angle APB$ is 0.52 rad and the length of the swing AOB is 15.6 cm, find area of the region swept by the pendulum.

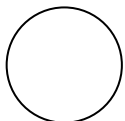
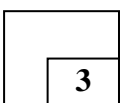
Jika $\angle APB$ ialah 0.52 rad dan panjang ayunan AOB ialah 15.6 cm, cari luas rantau yang dilalui oleh bandul itu.

[3 marks]

[3 markah]

Answer / Jawapan :

18



- 19** A set of 10 number have a mean of 13 and a standard deviation of 2. If 5 is added to each numbers, and each result is multiplied by 3,

Satu set 10 nombor mempunyai min 13 dan sisihan piawai 2. Jika setiap nombor itu ditambah dengan 5, kemudian didarab dengan 3.

Find

Cari

- (a) the new mean,
min baru,
- (b) the new standard deviation.
sisihan piawai baru.

[3 marks]
[3 markah]

Answer / *Jawapan :*

(a)

(b)

19

3

- 20** The mean of five numbers is \sqrt{x} . The sum of the squares of the numbers is 100 and the standard deviation is $2y^2$. Express x in terms of y .

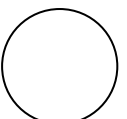
Min bagi lima nombor ialah \sqrt{x} . Hasil tambah kuasa dua nombor-nombor itu ialah 100 dan sisihan piawainya ialah $2y^2$. Ungkapkan x dalam sebutan y .

[2 marks]
[2 markah]

Answer / *Jawapan :*

20

2



21 Diagram 21 shows five types of car brand Honda that are arranged in a row.

Rajah 21 menunjukkan lima jenis kereta jenama Honda yang disusun secara sebaris.



Diagram 21/ *Rajah 21*

(a) Calculate the number of ways the types of car can be arranged without restriction.

Hitung bilangan cara semua kereta itu boleh disusun tanpa sebarang batasan.

(b) If the Honda Civic and Honda Accord are not supposed to place side by side, calculate the number of ways that all cars can be arranged.

Jika Honda Civic dan Honda Accord tidak boleh diletakkan bersebelahan, hitung bilangan cara semua kereta itu boleh disusun.

[3 marks]

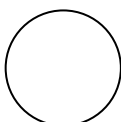
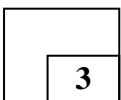
[3 markah]

Answer / *Jawapan* :

(a)

(b)

21



SULIT

19

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examiner's
use only

22 Given that ${}^n C_2 = 45$, find the value of n .

Diberi bahawa ${}^n C_2 = 45$, cari nilai bagi n .

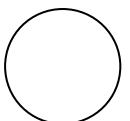
[2 marks]

[2 markah]

Answer / Jawapan :

22

2



- 23 During a school sports day, two sports houses 'Rumah Laksamana' and 'Rumah Bendahara', participated in three events. Table 23 shows the number of students participating in each event.

Semasa Hari Sukan Sekolah, dua rumah sukan iaitu Rumah Laksamana dan Rumah Bendahara, mengambil bahagian dalam tiga acara. Jadual 23 menunjukkan bilangan pelajar yang mengambil bahagian dalam setiap acara tersebut.

Event <i>Acara</i>	Sports house <i>Rumah Sukan</i>	
	Rumah Laksamana	Rumah Bendahara
100 m	40	50
Long Jump <i>Lompat Jauh</i>	10	15
Shot-put <i>Lontar Peluru</i>	20	15

Table 23 / *Jadual 23*

- (a) A student is chosen at random from the 'Rumah Laksamana'. Find the probability that the student participates in the Long Jump.

Seorang pelajar dipilih secara rawak dari 'Rumah Laksamana'. Cari kebarangkalian bahawa seorang pelajar mengambil bahagian dalam acara Lompat Jauh.

- (b) Two students are chosen at random from the Shot-put. Find the probability that both students are from sports 'Rumah Bendahara'.

Dua pelajar telah dipilih secara rawak dari acara lontar peluru. Cari kebarangkalian bahawa dua orang pelajar itu dari 'Rumah Bendahara'.

[3 marks]

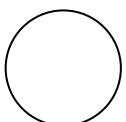
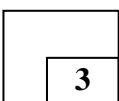
[3 markah]

Answer / *Jawapan* :

(a)

(b)

23



- 24 Diagram 24 shows the discrete random variable has a binomial probability with $n = 3$, where n is the number of trials.

Rajah 24 menunjukkan pemboleh ubah rawak diskret X mempunyai satu taburan kebarangkalian binomial $n = 3$, dengan keadaan n ialah bilangan percubaan.

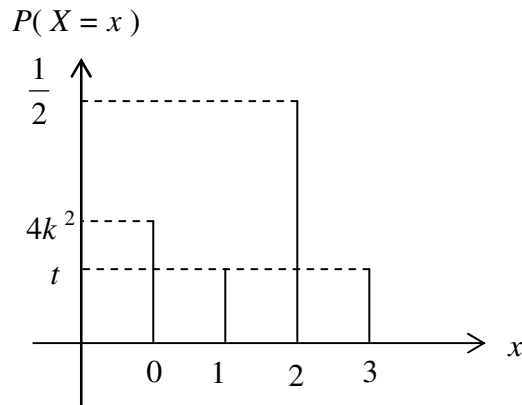


Diagram 24 / Rajah 24

- (a) Express t in terms of k .

Ungkapkan t dalam sebutan k .

- (b) Find $P(X \leq 2)$ if $k = \frac{1}{4}$.

Cari $P(X \leq 2)$ jika $k = \frac{1}{4}$.

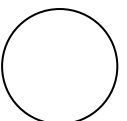
[3 marks]

[3 markah]

Answer / Jawapan :

(a)

(b)



- 25 The weight of the students of SMK Bera are normally distributed with mean 40 kg and standard deviation 5 kg.

Jisim pelajar SMK Bera bertabur secara normal dengan min 40 kg dan sisihan piawai 5 kg.

- (a) Find the probability of students with weight more than 50 kg.

Cari kebarangkalian pelajar dengan jisim lebih daripada 50 kg.

- (b) If the mean weight of students in SMK Jengka is x kg and the standard deviation is the same as that of SMK Bera, and 5% of the students in SMK Jengka have weights more than 60 kg, find the value of x .

Jika jisim min pelajar di SMK Jengka ialah x kg dan sisihan piawai adalah sama dengan SMK Bera, dan 5% daripada pelajar SMK Jengka mempunyai jisim melebihi 60 kg, cari nilai x .

[4 marks]

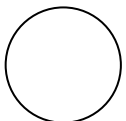
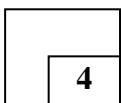
[4 markah]

Answer / Jawapan :

(a)

(b)

25



Kertas Soalan Tamat