

Rumus-rumus berikut boleh membantu anda menjawab soalan. Simbol-simbol yang diberi adalah yang biasa digunakan.

The following formulae may be helpful in answering the questions. The symbols given are the ones commonly used.

SENARAI RUMUS
LIST OF FORMULAE

- | | |
|--|---|
| <p>1 $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$</p> <p>2 $\log_a b = \frac{\log_c b}{\log_c a}$</p> <p>3 $T_n = a + (n - 1)d$</p> <p>4 $T_n = ar^{n-1}$</p> <p>5 $S_n = \frac{n}{2} [2a + (n - 1)d]$</p> <p>6 $S_n = \frac{a(r^n - 1)}{r - 1} = \frac{a(1 - r^n)}{1 - r}, r \neq 1$</p> <p>7 $Z = \frac{X - \mu}{\sigma}$</p> <p>8 $P(X = r) = {}^n C_r p^r q^{n-r}, p + q = 1$</p> <p>9 ${}^n P_r = \frac{n!}{(n - r)!}$</p> <p>10 ${}^n C_r = \frac{n!}{(n - r)! r!}$</p> <p>11 $I = \frac{Q_1}{Q_0} \times 100$</p> <p>12 $\bar{I} = \frac{\sum W_i I_i}{\sum W_i}$</p> <p>13 $\sin^2 \theta + \cos^2 \theta = 1$
$\sin^2 \theta + \cos^2 \theta = 1$</p> <p>14 $\sec^2 A = 1 + \tan^2 A$
$\sec^2 A = 1 + \tan^2 A$</p> | <p>15 $\operatorname{kosek}^2 A = 1 + \cot^2 A$
$\operatorname{cosec}^2 A = 1 + \cot^2 A$</p> <p>16 $\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$
$\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$</p> <p>17 $\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$
$\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$</p> <p>18 $\tan(A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$</p> <p>19 $\sin 2A = 2 \sin A \cos A$
$\sin 2A = 2 \sin A \cos A$</p> <p>20 $\cos 2A = \cos^2 A - \sin^2 A$
$= 2 \cos^2 A - 1$
$= 1 - 2 \sin^2 A$
$\cos 2A = \cos^2 A - \sin^2 A$
$= 2 \cos^2 A - 1$
$= 1 - 2 \sin^2 A$</p> <p>21 $\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$</p> <p>22 $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$</p> <p>23 $a^2 = b^2 + c^2 - 2bc \cos A$
$a^2 = b^2 + c^2 - 2bc \cos A$</p> <p>24 Luas segi tiga / <i>Area of triangle</i>
$= \frac{1}{2} ab \sin C$</p> |
|--|---|

Bahagian A
Section A

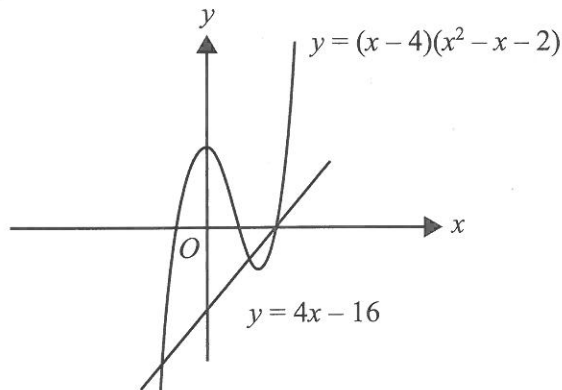
[50 markah]

[50 marks]

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

- 1 Rajah 1 menunjukkan persilangan antara garis lurus $y = 4x - 16$ dan lengkung $y = (x - 4)(x^2 - x - 2)$.

Diagram 1 shows the intersections of the straight line $y = 4x - 16$ and the curve $y = (x - 4)(x^2 - x - 2)$.



Rajah 1
Diagram 1

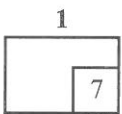
Cari titik-titik koordinat persilangan itu.

Find the coordinates of the points of intersection.

[7 markah]

[7 marks]

Jawapan / Answer :



- 2 Isi padu sebuah silinder menyusut dengan kadar $0.25 \text{ cm}^3 \text{ s}^{-1}$. Tinggi silinder, h cm adalah dua kali ganda jejari, r cm.

The volume of a cylinder decreases at a rate of $0.25 \text{ cm}^3 \text{ s}^{-1}$. The height, h cm of the cylinder is twice the radius, r cm.

- (a) Hitung kadar perubahan jejari apabila jejari adalah 2 cm.

Calculate the rate of change of the radius when the radius is 2 cm.

[3 markah]

[3 marks]

- (b) Hitung kadar perubahan aras air ketika jejari adalah 4 cm.

Calculate the rate of change of the water level when the radius is 4 cm.

[4 markah]

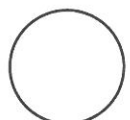
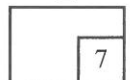
[4 marks]

Jawapan / Answer :

(a)

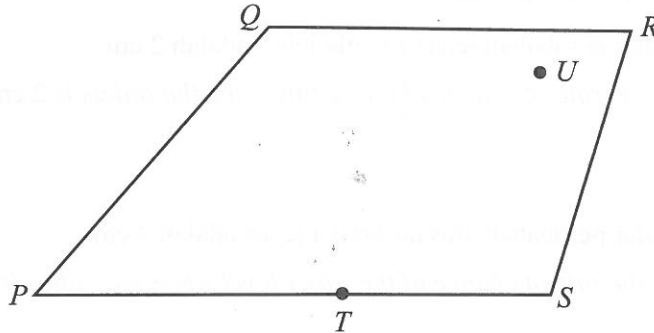
(b)

2



- 3 Rajah 2 menunjukkan sebuah trapezium $PQRS$. T ialah satu titik terletak pada garis lurus PS .

Diagram 2 shows a trapezium $PQRS$. T is a point lies on the straight line PS .



Rajah 2
Diagram 2

Diberi bahawa $\vec{PQ} = 8\underline{x}$, $\vec{PS} = 24\underline{y}$, $\vec{PT} = \frac{2}{3} \vec{PS}$ dan $\vec{QR} = \frac{3}{4} \vec{PS}$.

Given that $\vec{PQ} = 8\underline{x}$, $\vec{PS} = 24\underline{y}$, $\vec{PT} = \frac{2}{3} \vec{PS}$ and $\vec{QR} = \frac{3}{4} \vec{PS}$.

- (a) Ungkapkan \vec{PR} dalam sebutan \underline{x} dan \underline{y} .
Express \vec{PR} in terms of \underline{x} and \underline{y} .

[2 markah]
[2 marks]

- (b) Titik U terletak di dalam trapezium $PQRS$ dengan keadaan $\vec{TU} = (k - 1)\vec{PQ}$, dan k ialah pemalar.

Point U lies inside the trapezium $PQRS$ such that $\vec{TU} = (k - 1)\vec{PQ}$, and k is a constant.

- (i) Ungkapkan \vec{PU} dalam sebutan k , \underline{x} dan \underline{y} .

Express \vec{PU} in terms of k , \underline{x} and \underline{y} .

- (ii) Jika titik-titik P , U dan R adalah segaris, cari nilai k .

If points P , U and R are collinear, find the value of k .

[6 markah]
[6 marks]

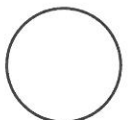
Jawapan / Answer :

(a)

(b) (i)

(ii)

3



- 4 Sebuah syarikat insurans menawarkan satu pelan simpanan dengan keadaan pelanggan hanya membuat simpanan duit selama 10 tahun pertama. Simpanan bagi tempoh 10 tahun ini membentuk satu jangjang aritmetik. Diberi bahawa simpanan bulanan bagi tiga tahun pertama ialah RM500, RM550 dan RM600. Maklumat lain mengenai pelan simpanan ini telah diberi seperti dalam Rajah 3.

An insurance company offers a savings plan with customers only making savings for the first 10 years. The savings for the 10 years formed an arithmetic progression. Given that the monthly savings for the first three years are RM500, RM550 and RM600. Others information about the savings plan are given as in Diagram 3.



Rajah 3
Diagram 3

- (a) Sebelum mencukupi 10 tahun, Diana ingin mengeluarkan semua simpanan dan faedahnya yang berjumlah RM79 380.
Pada tahun ke-berapakah Diana mengeluarkan wangnya?

Before enough of 10 years, Diana wants to withdraw all her savings and interest amounting to RM79 380.

In which year does Diana withdraw her money?

[3 markah]

[3 marks]

- (b) Jeremy telah menyimpan dalam pelan simpanan ini selama 18 tahun, sekarang dia ingin mengeluarkan semua wangnya.

Berapakah jumlah wang yang akan diperoleh Jeremy?

Apakah purata kadar faedah tahunan yang Jeremy peroleh melalui simpanan ini?

Jeremy has saved under this savings plan for 18 years, now he wants to withdraw all his money.

How much money in total will Jeremy get?

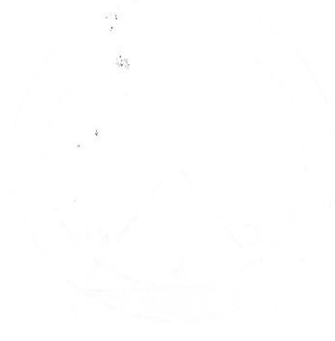
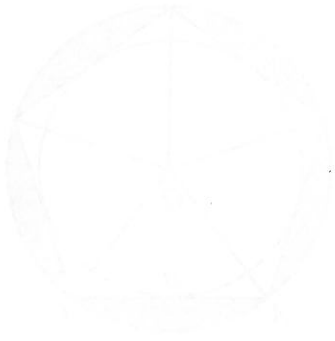
What is the average annual interest rate that Jeremy gets from this savings?

[4 markah]

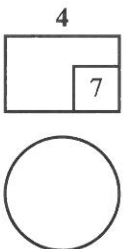
[4 marks]

Jawapan / Answer :

(a)

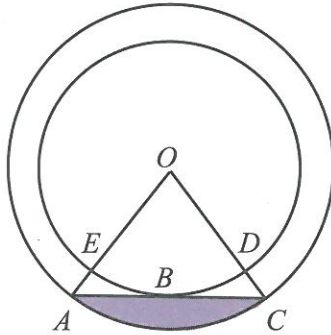


(b)

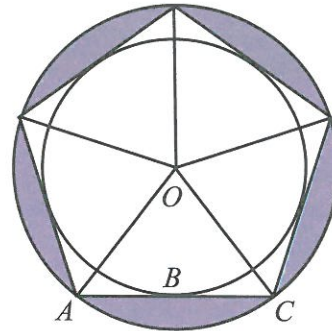


- 5 Rajah 4(a) menunjukkan dua bulatan sepusat dengan pusat O . ABC ialah tangen kepada bulatan yang lebih kecil di B . Lima segi tiga OAC membentuk satu pentagon sekata diterap dalam bulatan yang lebih besar seperti dalam Rajah 4(b).

Diagram 4(a) shows two concentric circles with the center O . ABC is a tangent to the smaller circle at B . Five triangles OAC form a regular pentagon inscribed the bigger circle as in Diagram 4(b).



Rajah 4(a)
Diagram 4(a)



Rajah 4(b)
Diagram 4(b)

Dengan menggunakan $\pi = 3.142$,

By using $\pi = 3.142$,

- (a) tunjukkan bahawa panjang $OA = 9.889$ cm, diberi bahawa $OD = 8$ cm.
show that the length of $OA = 9.889$ cm, given that $OD = 8$ cm.

[1 markah]

[1 mark]

- (b) hitung
calculate

- (i) beza antara panjang, dalam cm, lengkok AC dan lengkok DE .
the difference between the length, in cm, of arc AC and arc DE .

- (ii) luas, dalam cm^2 , bagi kawasan berwarna biru dalam Rajah 4(b).
the area, in cm^2 , of the blue coloured region in Diagram 4(b).

[6 markah]

[6 marks]

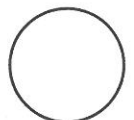
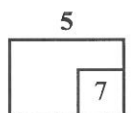
Jawapan / Answer :

- (a)



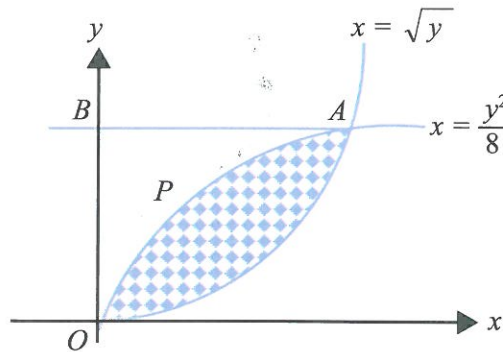
(b) (i)

(ii)



- 6 Rajah 5 menunjukkan dua lengkung $x = \sqrt{y}$ dan $x = \frac{y^2}{8}$ bersilang pada titik A .
Garis lurus AB selari dengan paksi- x .

*Diagram 5 shows two curves $x = \sqrt{y}$ and $x = \frac{y^2}{8}$ are intersecting at point A .
The straight line AB is parallel to the x -axis.*



Rajah 5
Diagram 5

Cari
Find

- (a) persamaan garis lurus AB ,
the equation of the straight line AB , [2 markah]
[2 marks]
- (b) luas, dalam unit², bagi kawasan berlorek,
area, in unit², of the shaded region, [3 markah]
[3 marks]
- (c) isi padu yang dijanakan, dalam sebutan π , apabila rantau P , yang dibatasi oleh
lengkung $x = \frac{y^2}{8}$, garis lurus AB dan paksi- y dikisarkan 360° pada paksi- y .
*the volume generated, in term of π , when the region P , which bounded by the
curve $x = \frac{y^2}{8}$, the straight line AB and the y -axis, is revolved 360° about the
 y -axis.* [3 markah]
[3 marks]

Jawapan / Answer :

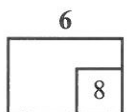
(a)

[4 marks]
[4 marks]

(b)

[4 marks]
[4 marks]

(c)



7 (a) Tunjukkan bahawa $\frac{2 \sin x}{(2 \sin^2 x - 1) \sec x} = -\tan 2x$.

Show that $\frac{2 \sin x}{(2 \sin^2 x - 1) \sec x} = -\tan 2x$.

[2 markah]

[2 marks]

- (b) (i) Kemudian, lakarkan graf $y = \frac{2 \sin x}{(2 \sin^2 x - 1) \sec x}$ bagi $0 \leq x \leq \pi$ dalam ruang jawapan yang disediakan.

Hence, sketch the graph of $y = \frac{2 \sin x}{(2 \sin^2 x - 1) \sec x}$ for $0 \leq x \leq \pi$ in the answer space provided.

- (ii) Tentukan nilai p , dengan keadaan p ialah satu pemalar supaya bilangan penyelesaian bagi persamaan $\frac{2 \sin x}{(2 \sin^2 x - 1) \sec x} = p$ bukan 2.

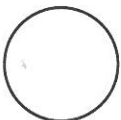
Determine the value of p where p is a constant such that the number of solution for the equation $\frac{2 \sin x}{(2 \sin^2 x - 1) \sec x} = p$ is not 2.

[4 markah]

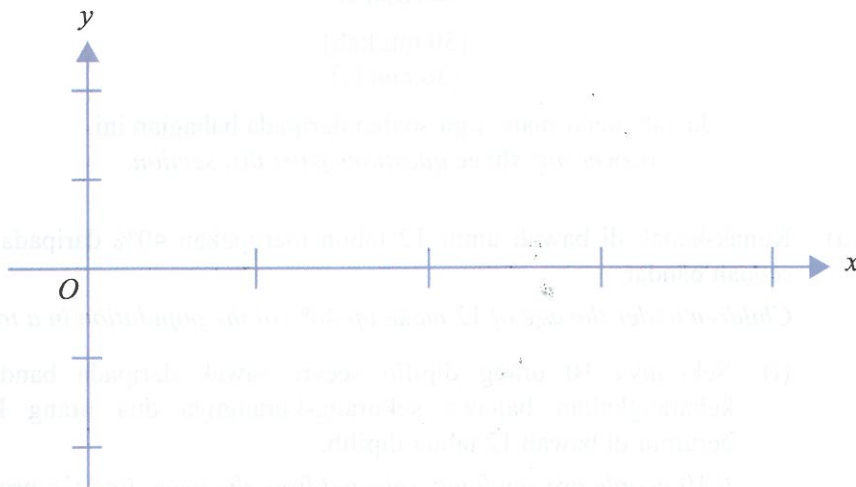
[4 marks]

Jawapan / Answer :

(a)



(b) (i)



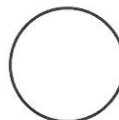
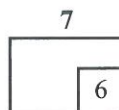
(ii)

[3 marks]
[2 marks]

197. A variable X is normally distributed with mean μ and standard deviation σ . It is given that $P(X < \mu - \sigma) = 0.2420$ and $P(X < \mu + \sigma) = 0.7580$. Find the value of μ and σ .

The number of items produced in a factory is normally distributed with a mean of 1000 and a standard deviation of 100. Find the probability that the number of items produced is between 800 and 1200.

[2 marks]
[2 marks]



Bahagian B
Section B

[30 markah]

[30 marks]

Jawab mana-mana **tiga** soalan daripada bahagian ini.

*Answer any **three** questions from this section.*

- 8 (a) Kanak-kanak di bawah umur 12 tahun merupakan 40% daripada populasi di sebuah bandar.

Children under the age of 12 make up 40% of the population in a town.

- (i) Sekiranya 10 orang dipilih secara rawak daripada bandar itu, cari kebarangkalian bahawa sekurang-kurangnya dua orang kanak-kanak berumur di bawah 12 tahun dipilih.

If 10 people are randomly selected from the town, find the probability that at least two children under the age of 12 are chosen.

- (ii) Sekiranya varians bagi bilangan kanak-kanak berumur di bawah 12 ialah 192, apakah populasi bagi bandar tersebut?

If the variance of the number of children under the age of 12 is 192, what is the population of the town?

[5 markah]

[5 marks]

- (b) Berat badan pekerja dalam sebuah kilang bertabur secara normal dengan min 65 kg dan varians 36 kg². 148 orang pekerja di kilang tersebut mempunyai berat badan di antara 58 kg dengan 70 kg.

Hitungkan jumlah pekerja dalam kilang tersebut.

The masses of the workers in a factory are normally distributed with a mean of 65 kg and variance of 36 kg². 148 of the workers in the factory weight between 58 kg and 70 kg.

Calculate the total number of workers in the factory.

[5 markah]

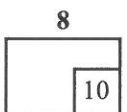
[5 marks]

Jawapan / Answer :

(a) (i)

(ii)

(b)



HALAMAN KOSONG
BLANK PAGE



- 9 Guna kertas graf yang disediakan pada halaman 21 untuk menjawab soalan ini.

Use the graph paper provided on page 21 to answer this question.

Celline sedang menjalankan suatu eksperimen bagi menentukan kadar tindak balas antara asid hidroklorik dan logam magnesium. Eksperimen itu melibatkan R iaitu kadar tindak balas dan T iaitu suhu. Pemboleh ubah R dan T dihubungkan oleh persamaan $R = k(2)^{-\frac{h}{T}}$, dengan keadaan h dan k ialah pemalar. Celline mencatatkan hasil eksperimen tersebut dalam Jadual 1.

Celline is conducting an experiment to determine the rate of reaction between hydrochloric acid and magnesium metal. The experiment involves R as the rate of reaction and T as the temperature. Variables R and T are related by the equation

$R = k(2)^{-\frac{h}{T}}$, where h and k are constants. Celline recorded the results of the experiment in Table 1.

Suhu, T ($^{\circ}\text{C}$) Temperature, T ($^{\circ}\text{C}$)	83.4	50.0	32.3	19.9	17.3
Kadar tindak balas, R (cm^3s^{-1}) Rate of reaction, R (cm^3s^{-1})	38.8	24.0	19.0	9.11	6.61

Jadual 1

Table 1

- (a) Plot graf $\log_{10} R$ melawan $\frac{1}{T}$, dengan menggunakan skala 2 cm kepada 0.01 unit pada paksi- $\frac{1}{T}$ dan 2 cm kepada 0.2 unit pada paksi- $\log_{10} R$.

Seterusnya, lukiskan garis lurus penyuaiian terbaik.

Plot the graph of $\log_{10} R$ against $\frac{1}{T}$, by using a scale of 2 cm to 0.01 unit on $\frac{1}{T}$ -axis and 2 cm to 0.2 units on $\log_{10} R$ -axis.

Hence, draw the line of best fit.

[5 markah]

[5 marks]

- (b) Menggunakan graf di 9(a), hitung nilai k dan h .

Using the graph in 9(a), calculate the value of k and h .

[4 markah]

[4 marks]

- (c) Didapati bahawa terdapat satu kadar tindak balas yang tersilap catat dalam Jadual 1.

Hitungkan kadar tindak balas yang tepat pada suhu tersebut.

It was found that a rate of reaction was recorded wrongly in Table 1.

Calculate the actual rate of reaction at that particular temperature.

[1 markah]

[1 mark]

Jawapan / Answer :

(a)

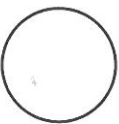
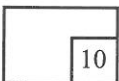
$\frac{1}{T}$					
$\log_{10} R$					

Rujuk kepada graf pada halaman 21.

Refer to the graph on page 21.

(b)

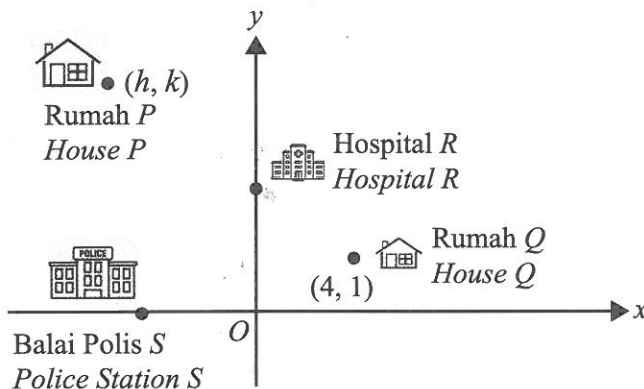
(c)



Graf untuk Soalan 9(a)
Graph for Question 9(a)

- 10 Rajah 6 menunjukkan kedudukan dua buah rumah iaitu P dan Q masing-masing dengan koordinat (h, k) dan $(4, 1)$.

Diagram 6 shows the position of two houses, P and Q with the coordinates (h, k) and $(4, 1)$ respectively.



Rajah 6
Diagram 6

Sebuah Hospital R terletak di antara dua rumah itu, P dan Q . Diberi persamaan garis lurus yang menyambungkan Balai Polis S , dengan Hospital R , ialah $y - 2x = 3$.

A Hospital R situated between the two houses, P and Q . Given the equation of the straight line that connects the Police Station S with the Hospital R , is $y - 2x = 3$.

Diberi bahawa 1 unit = 1 km,

Given that 1 unit = 1 km,

- (a) ungkapkan h dalam sebutan k , jika garis lurus SR berserenjang dengan garis lurus PQ .

express h in term of k , if the straight line SR is perpendicular to the straight line PQ .

[2 markah]

[2 marks]

- (b) cari koordinat Rumah P , diberi bahawa jarak Hospital R dari Rumah P dan Rumah Q adalah dalam nisbah 2 : 1.

find the coordinates of House P , given that the distance of the Hospital R from House P and House Q is in the ratio of 2 : 1.

[3 markah]

[3 marks]

- (c) jarak, dalam km, di antara Rumah P dengan Balai Polis S .
the distance, in km, between House P and the Police Station S .

[3 markah]

[3 marks]

- (d) luas, dalam km^2 , bagi segi tiga RSQ .
the area, in km^2 , of the triangle RSQ .

[2 markah]

[2 marks]

Jawapan / Answer :

(a)

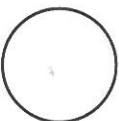
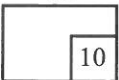
(b)



(c)

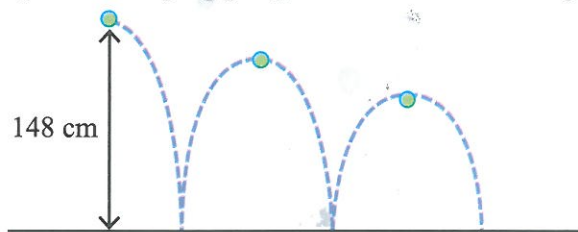
(d)

10



- 11 (a) Amir melepaskan sebiji bola ping pong pada ketinggian 148 cm dari permukaan lantai. Selepas setiap lantunan, bola ping pong itu mencapai ketinggian sebanyak $\frac{3}{4}$ daripada ketinggian sebelumnya seperti ditunjukkan pada Rajah 7. Bola ping pong itu terus melantun sehingga berhenti.

Amir drops a ping-pong ball at the height of 148 cm from the floor surface. After each bounce, the ping-pong ball reaches a height of $\frac{3}{4}$ from its previous height as shown in Diagram 7. The ping-pong ball continues bouncing until it stops.



Rajah 7
Diagram 7

Cari
Find

- (i) bilangan lantunan apabila ketinggian bola ping pong itu adalah kurang daripada 20 cm untuk kali pertama.
the number of bounces when the height of the ping-pong ball is less than 20 cm for the first time.
- (ii) jumlah jarak, dalam cm, yang dilalui oleh bola ping pong itu sehingga berhenti.
the total distance, in cm, travelled by the ping-pong ball until it stops.

[5 markah]

[5 marks]

- (b) Sebuah syarikat swasta berjaya mendapat keuntungan sebanyak 1.5 juta pada tahun 2015. Setiap tahun yang berikutnya, keuntungan syarikat itu meningkat sebanyak 4%.

A private company managed to make a profit of 1.5 million in the year 2015. In each subsequent year, the company's profit increased by 4%.

- (i) Cari jumlah keuntungan syarikat itu dari tahun 2016 hingga 2020.
Find the total profits of the company from the year 2016 to 2020.
- (ii) Jika 19% daripada keuntungan syarikat itu dari tahun 2018 hingga 2020 diperoleh daripada sumber pelaburan, hitung jumlah keuntungan syarikat itu yang berasaskan sumber pelaburan.
If 19% of the company's profit from the year 2018 to 2020 was gained from the investment sources, calculate the total profit of the company gained from the investment.

[5 markah]

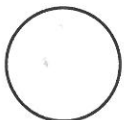
[5 marks]

Jawapan / Answer :

(a) (i)

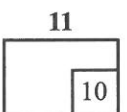


(ii)



(b) (i)

(ii)



Bahagian C
Section C

[20 markah]

[20 marks]

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

Answer any two questions from this section.

- 12 Satu zarah bergerak di sepanjang suatu garis lurus dan melalui satu titik tetap O . Sesarannya, s m, diberi bahawa $s = t^3 - \frac{15}{2}t^2 + 12t + 10$, dengan keadaan t ialah masa, dalam saat, sejak zarah itu berlepas dari titik O . Zarah itu berehat seketika di titik A dan kemudian di titik B .

[Pergerakan zarah ke kanan sebagai arah positif.]

A particle moves along a straight line and passes through a fixed point O . Its displacement, s m, given that $s = t^3 - \frac{15}{2}t^2 + 12t + 10$, where t is the time, in seconds, since the particle leaving from point O . The particle comes to instantaneous rest at point A and then at point B .

[The motion of the particle to the right as the positive direction.]

Cari

Find

- (a) julat masa zarah itu bergerak ke arah kanan,
the range of time when the particle moves toward the right,

[4 markah]

[4 marks]

- (b) julat masa zarah itu memecut,
the range of time when the particle accelerates,

[3 markah]

[3 marks]

- (c) jarak antara titik A dan titik B .
the distance between point A and point B .

[3 markah]

[3 marks]

Jawapan / Answer :

(a)

(b)

(c)

12

	10
--	----



HALAMAN KOSONG
BLANK PAGE

- 13 Guna kertas graf yang disediakan pada halaman 33 untuk menjawab soalan ini.

Use the graph paper provided on page 33 to answer this question.

Pusat Muzik Melody menawarkan kursus piano dan kursus gitar. Bilangan murid yang mendaftar kursus piano dan kursus gitar masing-masing ialah x dan y . Pendaftaran murid bagi dua kursus ini adalah berdasarkan kekangan berikut:

Pusat Muzik Melody offers piano course and guitar course. The number of students who register for piano course and guitar course are x and y respectively. The registration of students for the two courses are based on the following constraints:

- I Jumlah murid yang mendaftar tidak melebihi 60 orang.
The total number of students register not more than 60 people.
- II Nisbah bilangan murid kursus gitar kepada bilangan murid kursus piano adalah sekurang-kurangnya 2 : 3.
The ratio of the number of students in guitar course to the number of students in piano course is at least 2 : 3.
- III Bilangan murid bagi kursus gitar melebihi bilangan murid kursus piano selebih-lebihnya 30 orang.
The number of students in guitar course exceed the number of students in piano course by at most 30 people.

- (a) Tulis tiga ketaksamaan, selain daripada $x \geq 0$ dan $y \geq 0$, yang memenuhi semua kekangan di atas.

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

[3 markah]

[3 marks]

- (b) Dengan menggunakan skala 2 cm kepada 10 orang murid pada kedua-dua paksi, bina dan lorek rantau R yang memenuhi semua kekangan di atas.

By using a scale of 2 cm to 10 students on both axes, construct and shade the region R which satisfies all the above constraints.

[3 markah]

[3 marks]

- (c) Jawab soalan berikut dengan menggunakan graf yang dibina di 13(b).
Answer the following questions by using the graph constructed in 13(b).

Diberi bahawa Pusat Muzik Melody perlu membayar sewaan kedai sebanyak RM6 500 setiap bulan. Sekiranya yuran bagi kursus piano dan kursus gitar masing-masing ialah RM120 dan RM80 dalam satu bulan, adakah Pusat Muzik Melody dapat kekal berniaga dengan hanya menawarkan dua kursus ini dengan memenuhi semua kekangan di atas?

Berikan justifikasi anda.

Given that Pusat Muzik Melody needs to pay RM6 500 as the rental of the shop monthly. If the fees for the piano course and the guitar course are RM120 and RM80 per month respectively, can Pusat Muzik Melody sustain by only offering these two courses by satisfying all the above constraints?

Give your justification.

[4 markah]

[4 marks]

Jawapan / Answer :

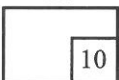
(a)

(b) Rujuk kepada graf pada halaman 33.

Refer to the graph on page 33.

(c)

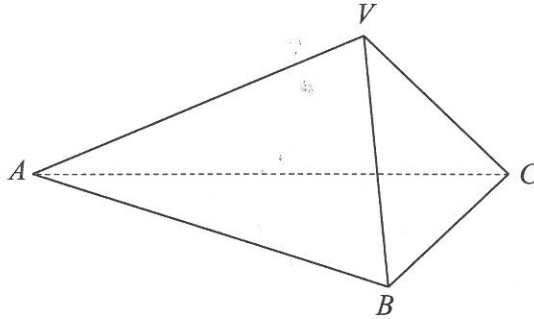
13



Graf untuk Soalan 13(b)
Graph for Question 13(b)

- 14 Rajah 8 menunjukkan sebuah khemah $VABC$ dalam bentuk piramid dengan segi tiga ABC sebagai tapak mengufuk. V ialah bucu khemah dan sudut di antara satah condong VBC dengan tapak ialah 42° .

Diagram 8 shows a tent $VABC$ in the shape of a pyramid with triangle ABC as the horizontal base. V is the vertex of the tent and the angle between the inclined plane VBC and the base is 42° .



Rajah 8
Diagram 8

Diberi bahawa $VB = VC = 2.6$ m dan $AB = AC = 3.2$ m, hitung
Given that $VB = VC = 2.6$ m and $AB = AC = 3.2$ m, calculate

- (a) panjang BC jika luas segi tiga VBC ialah 2.5893 m²,
the length of BC if the area of the triangle VBC is 2.5893 m²,

[2 markah]
[2 marks]

- (b) panjang AV jika sudut di antara garis lurus AV dan tapak ialah 37° ,
the length of AV if the angle between the straight line AV and the base is 37° ,

[3 markah]
[3 marks]

- (c) sudut di antara dua satah condong VAB dan VAC .
the angle between the two incline planes VAB and VAC .

[5 markah]
[5 marks]

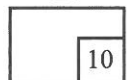
Jawapan / Answer :

(a)

(b)			

(c)

14



- 15 Jadual 2 menunjukkan indeks harga bagi empat bahan *A*, *B*, *C* dan *D* yang digunakan untuk menghasilkan sejenis cat pada tahun 2014 berasaskan tahun 2010 serta pemberatnya yang sepadan.

Table 2 shows the price index of four types of materials A, B, C and D used to produce a type of paint in the year 2014 based on the year 2010 as well as their corresponding weightages.

Bahan <i>Material</i>	Indeks harga pada 2014 berasaskan 2010 <i>Price index in 2014 based on 2010</i>	Pemberat <i>Weightage</i>
<i>A</i>	105	3
<i>B</i>	<i>m</i>	4
<i>C</i>	125	6
<i>D</i>	140	<i>n</i>

Jadual 2
Table 2

- (a) Diberi harga bahan *B* pada tahun 2014 dan 2010 masing-masing ialah RM60 dan RM50.

Given the price of material B in the year 2014 and 2010 are RM60 and RM50 respectively.

Cari
Find

- (i) nilai *m*.
the value of m.
- (ii) nilai *n*, jika indeks gubahan bagi harga cat pada tahun 2014 berasaskan tahun 2010 ialah 126.25.
the value of n, if the composite index for the prices of the paint in the year 2014 based on the year 2010 is 126.25.

[5 markah]
[5 marks]

- (b) Harga bagi bahan *A*, *C* dan *D* masing-masing bertambah sebanyak 10%, 15% dan 5% dari tahun 2014 ke tahun 2016 manakala harga bahan *B* tidak berubah.

The price for material A, C and D increased by 10%, 15% and 5% respectively from year 2014 to the year 2016 while the price of material B remains unchanged.

- (i) Hitung indeks gubahan pada tahun 2016 berasaskan tahun 2010.

Calculate the composite index in the year 2016 based on the year 2010.

- (ii) Seterusnya, hitung kos penghasilan cat pada tahun 2016 jika kos yang sepadan pada tahun 2010 ialah RM27.

Hence, calculate the cost of making the paint in the year 2016 if the corresponding cost in the year 2010 is RM27.

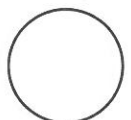
[5 markah]

[5 marks]

Jawapan / Answer :

- (a) (i)

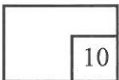
- (ii)



(b) (i)

(ii)

15



10



3472/2

KERTAS PEPERIKSAAN TAMAT
END OF QUESTION PAPER

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

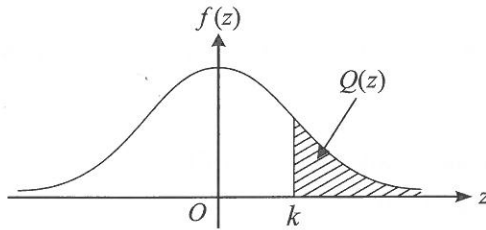
z	0 1 2 3 4 5 6 7 8 9									1 2 3 4 5 6 7 8 9									
	Minus / Tolak																		
0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641	4	8	12	16	20	24	28	32	36
0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247	4	8	12	16	20	24	28	32	36
0.2	0.4207	0.4168	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	13	14
1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681	1	3	4	6	7	8	10	11	13
1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559	1	2	4	5	6	7	8	10	11
1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455	1	2	3	4	5	6	7	8	9
1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367	1	2	3	4	4	5	6	7	8
1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294	1	1	2	3	4	4	5	6	6
1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233	1	1	2	2	3	4	4	5	5
2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183	0	1	1	2	2	3	3	4	4
2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143	0	1	1	2	2	2	3	3	4
2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110	0	1	1	1	2	2	2	3	3
2.3	0.0107	0.0104	0.0102								0	1	1	1	1	2	2	2	2
			0.00990								3	5	8	10	13	15	18	20	23
				0.00964	0.00939	0.00914					2	5	7	9	12	14	16	16	21
								0.00889	0.00866	0.00842									
2.4	0.00820	0.00798	0.00776	0.00755	0.00734						2	4	6	8	11	13	15	17	19
						0.00714	0.00695	0.00676	0.00657	0.00639									
2.5	0.00621	0.00604	0.00587	0.00570	0.00554	0.00539	0.00523	0.00508	0.00494	0.00480									
2.6	0.00466	0.00453	0.00440	0.00427	0.00415	0.00402	0.00391	0.00379	0.00368	0.00357									
2.7	0.00347	0.00336	0.00326	0.00317	0.00307	0.00298	0.00289	0.00280	0.00272	0.00264									
2.8	0.00256	0.00248	0.00240	0.00233	0.00226	0.00219	0.00212	0.00205	0.00199	0.00193									
2.9	0.00187	0.00181	0.00175	0.00169	0.00164	0.00159	0.00154	0.00149	0.00144	0.00139									
3.0	0.00135	0.00131	0.00126	0.00122	0.00118	0.00114	0.00111	0.00107	0.00104	0.00100									

Bagi z negatif guna hubungan:

For negative z use relation:

$$Q(z) = 1 - Q(-z) = P(-z)$$

$$f(z) = \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{1}{2}z^2\right)$$



Contoh / Example:

Jika $X \sim N(0, 1)$, maka

If $X \sim N(0, 1)$, then

$$P(X > k) = Q(k)$$

$$P(X > 2.1) = Q(2.1) = 0.0179$$

MAKLUMAT UNTUK CALON
INFORMATION FOR CANDIDATES

1. Kertas peperiksaan ini mengandungi tiga bahagian: **Bahagian A**, **Bahagian B** dan **Bahagian C**.
This question paper consists of three section: Section A, Section B and Section C.
2. Jawab **semua** soalan dalam **Bahagian A** dan mana-mana **tiga** soalan daripada **Bahagian B** dan mana-mana **dua** soalan daripada **Bahagian C**.
Answer all questions in Section A, any three questions from Section B and any two questions from Section C.
3. Tulis jawapan anda dalam ruang yang disediakan dalam kertas peperiksaan.
Write your answers in the spaces provided in the question paper.
4. Tunjukkan langkah-langkah penting dalam kerja mengira anda. Ini boleh membantu anda untuk mendapatkan markah.
Show your working. It may help you to get marks.
5. Sekiranya anda hendak menukar jawapan, batalkan jawapan yang telah dibuat. Kemudian tulis jawapan yang baharu.
If you wish to change your answer, cross out the answer that you have done. Then write down the new answer.
6. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
The diagrams in the questions provided are not drawn to scale unless stated.
7. Markah yang diperuntukkan bagi setiap soalan dan ceraian soalan ditunjukkan dalam kurungan.
The marks allocated for each question and sub-part of a question are shown in brackets.
8. Satu senarai rumus disediakan di halaman 2.
A list of formulae is provided on page 2.
9. Jadual Kebarangkalian Hujung Atas $Q(z)$ Bagi Taburan Normal $N(0, 1)$ disediakan di halaman 39.
The Upper Tail Probability $Q(z)$ For The Normal Distribution $N(0, 1)$ Table is provided on page 39.
10. Anda dibenarkan menggunakan kalkulator saintifik.
You may use a scientific calculator.
11. Serahkan kertas peperiksaan ini kepada pengawas peperiksaan di akhir peperiksaan.
Hand in this question paper to the invigilator at the end of the examination.