

SULIT

NO. KAD PENGENALAN

--	--	--	--	--	--	--	--	--	--

ANGKA GILIRAN

--	--	--	--	--	--	--	--



LEMBAGA PEPERIKSAAN
KEMENTERIAN PENDIDIKAN MALAYSIA

SIJIL PELAJARAN MALAYSIA 2021

MATEMATIK

Kertas 2

2 jam 30 minit

1449/2

JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

1. Tulis nombor kad pengenalan dan angka giliran anda pada ruang yang disediakan.
2. Kertas peperiksaan ini mengandungi tiga bahagian: Bahagian A, Bahagian B dan Bahagian C.
3. Jawapan hendaklah ditulis pada ruang jawapan yang disediakan di dalam kertas peperiksaan ini.
4. Kertas peperiksaan ini adalah dalam dwibahasa.
5. Jawapan boleh ditulis dalam bahasa Melayu atau bahasa Inggeris.
6. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
7. Kerja mengira anda mesti ditunjukkan.
8. Kertas peperiksaan ini hendaklah diserahkan kepada pengawas peperiksaan pada akhir peperiksaan.

Tampal pelekats di sini

Kertas peperiksaan ini mengandungi 41 halaman bercetak dan 3 halaman tidak bercetak.

[Lihat halaman sebelah

1449/2 © 2021 Hak Cipta Kerajaan Malaysia

SULIT

NOMBOR DAN OPERASI NUMBER AND OPERATIONS

- | | |
|---|--|
| <p>1 $a^m \times a^n = a^{m+n}$</p> <p>3 $(a^m)^n = a^{mn}$</p> <p>5 $a^{\frac{m}{n}} = (a^{\frac{1}{n}})^m = (a^{\frac{1}{n}})^m$</p> <p>7 Faedah mudah / <i>Simple interest</i>,
$I = Prt$</p> <p>9 Jumlah bayaran balik / <i>Total repayment</i>, $A = P + Prt$</p> <p>10 $\text{Premium} = \frac{\text{Nilai muka polisi}}{\text{RMx}} \times (\text{Kadar premium per RMx})$

 $\text{Premium} = \frac{\text{Face value of policy}}{\text{RMx}} \times (\text{Premium rate per RMx})$</p> <p>11 Jumlah insurans yang harus dibeli = $\left(\frac{\text{Peratusan ko-insurans}}{\text{ko-insurans}} \right) \times \left(\frac{\text{Nilai boleh insurans harta}}{\text{insurans harta}} \right)$

 $\text{Amount of required insurance} = \left(\frac{\text{Percentage of co-insurance}}{\text{co-insurance}} \right) \times \left(\frac{\text{Insurable value of property}}{\text{of property}} \right)$</p> | <p>2 $a^m \div a^n = a^{m-n}$</p> <p>4 $a^{\frac{1}{n}} = \sqrt[n]{a}$</p> <p>6 $a^{\frac{m}{n}} = \sqrt[n]{a^m} = (\sqrt[n]{a})^m$</p> <p>8 Nilai matang / <i>Maturity value</i>,
$MV = P \left(1 + \frac{r}{n} \right)^n$</p> |
|---|--|

PERKAITAN DAN ALGEBRA RELATIONSHIP AND ALGEBRA

- | | |
|---|---|
| <p>1 Jarak / <i>Distance</i>
$= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$</p> <p>3 Laju purata = $\frac{\text{Jumlah jarak}}{\text{Jumlah masa}}$

 $\text{Average speed} = \frac{\text{Total distance}}{\text{Total time}}$</p> <p>5 $A^{-1} = \frac{1}{ad - bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$</p> | <p>2 Titik tengah / <i>Midpoint</i>,
$(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$</p> <p>4 $m = \frac{y_2 - y_1}{x_2 - x_1}$</p> <p>6 $m = -\frac{\text{pintasan-y}}{\text{pintasan-x}}$

 $m = -\frac{\text{y-intercept}}{\text{x-intercept}}$</p> |
|---|---|

SUKATAN DAN GEOMETRI
MEASUREMENT AND GEOMETRY

- 1 Teorem Pythagoras / *Pythagoras Theorem*, $c^2 = a^2 + b^2$
- 2 Hasil tambah sudut pedalaman poligon / *Sum of interior angles of a polygon*
 $= (n - 2) \times 180^\circ$
- 3 Lilitan bulatan = $\pi d = 2\pi j$
Circumference of circle = $\pi d = 2\pi r$
- 4 Luas bulatan = πj^2
Area of circle = πr^2
- 5 $\frac{\text{Panjang lengkok}}{2\pi j} = \frac{\theta}{360^\circ}$
 $\frac{\text{Arc length}}{2\pi r} = \frac{\theta}{360^\circ}$
- 6 $\frac{\text{Luas sektor}}{\pi j^2} = \frac{\theta}{360^\circ}$
 $\frac{\text{Area of sector}}{\pi r^2} = \frac{\theta}{360^\circ}$
- 7 Luas layang = $\frac{1}{2} \times$ hasil darab panjang dua pepenjuru
Area of kite = $\frac{1}{2} \times$ product of two diagonals
- 8 Luas trapezium = $\frac{1}{2} \times$ hasil tambah dua sisi selari $\times$ tinggi
Area of trapezium = $\frac{1}{2} \times$ sum of two parallel sides $\times$ height
- 9 Luas permukaan silinder = $2\pi j^2 + 2\pi jt$
Surface area of cylinder = $2\pi r^2 + 2\pi rh$
- 10 Luas permukaan kon = $\pi j^2 + \pi js$
Surface area of cone = $\pi r^2 + \pi rs$
- 11 Luas permukaan sfera = $4\pi j^2$
Surface area of sphere = $4\pi r^2$
- 12 Isi padu prisma = luas keratan rentas $\times$ tinggi
Volume of prism = cross sectional area $\times$ height
- 13 Isi padu silinder = $\pi j^2 t$
Volume of cylinder = $\pi r^2 h$

[Lihat halaman sebelah
SULIT

- 14 Isi padu kon = $\frac{1}{3}\pi r^2 h$
Volume of cone = $\frac{1}{3}\pi r^2 h$
- 15 Isi padu sfera = $\frac{4}{3}\pi r^3$
Volume of sphere = $\frac{4}{3}\pi r^3$
- 16 Isi padu piramid = $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$
Volume of pyramid = $\frac{1}{3} \times \text{base area} \times \text{height}$
- 17 Faktor skala, $k = \frac{PA'}{PA}$
Scale factor, k = $\frac{PA'}{PA}$
- 18 Luas imej = $k^2 \times \text{luas objek}$
Area of image = $k^2 \times \text{area of object}$

STATISTIK DAN KEBARANGKALIAN
STATISTICS AND PROBABILITY

- 1 Min / Mean, $\bar{x} = \frac{\sum x}{N}$
- 2 Min / Mean, $\bar{x} = \frac{\sum fx}{\sum f}$
- 3 Varians / Variance, $\sigma^2 = \frac{\sum x^2}{N} - \bar{x}^2 = \frac{\sum (x - \bar{x})^2}{N}$
- 4 Varians / Variance, $\sigma^2 = \frac{\sum fx^2}{\sum f} - \bar{x}^2 = \frac{\sum f(x - \bar{x})^2}{\sum f}$
- 5 Sisihan piawai / Standard deviation, $\sigma = \sqrt{\frac{\sum x^2}{N} - \bar{x}^2} = \sqrt{\frac{\sum (x - \bar{x})^2}{N}}$
- 6 Sisihan piawai / Standard deviation, $\sigma = \sqrt{\frac{\sum fx^2}{\sum f} - \bar{x}^2} = \sqrt{\frac{\sum f(x - \bar{x})^2}{\sum f}}$
- 7 $P(A) = \frac{n(A)}{n(S)}$
- 8 $P(A') = 1 - P(A)$

Bahagian A

[40 markah]

Jawab semua soalan.

- 1 Diberi bahawa perimeter sebuah segi empat sama ialah $4x + 4$.

Ungkapkan luas segi empat sama itu dalam sebutan x .

[2 markah]

*It is given that the perimeter of a square is $4x + 4$.**Express the area of the square in terms of x .*

[2 marks]

Jawapan / Answer:



- 2 Rajah 1 menunjukkan lima keping kad nombor yang disusun mengikut suatu jujukan.

Diagram 1 shows five numbered cards that have been arranged according to a sequence.



Rajah 1
Diagram 1

- (a) Nyatakan nilai J dan nilai K .

[2 markah]

State the value of J and of K .

[2 marks]

- (b) Seterusnya, nyatakan pola bagi jujukan itu.

[1 markah]

Hence, state the pattern of the sequence.

[1 mark]

Jawapan / Answer:

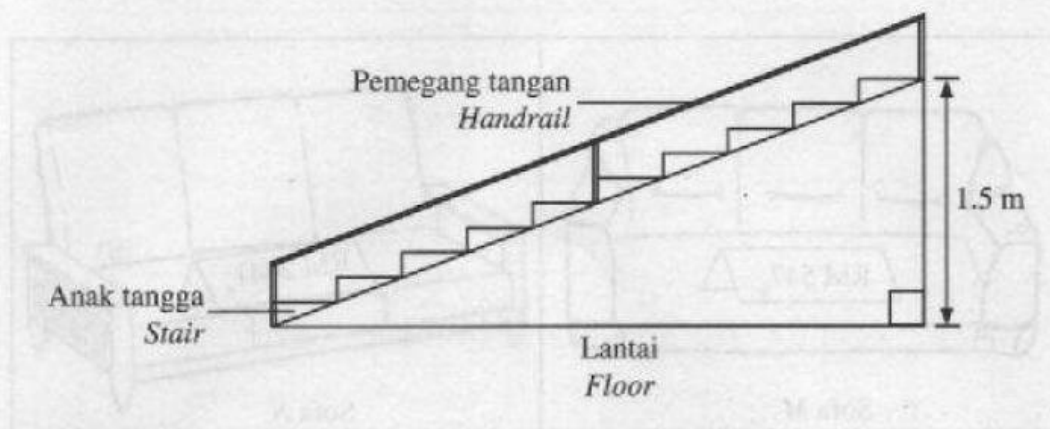
- (a) $J =$ _____

$K =$ _____

- (b)

- 3 Rajah 2 menunjukkan keratan rentas sebuah tangga.

Diagram 2 shows the cross-section of a staircase.



Rajah 2
Diagram 2

Diberi bahawa kecerunan tangga ialah 0.25.

It is given that the gradient of the staircase is 0.25.

- (a) Hitung sudut antara tangga dengan lantai. [2 markah]

Calculate the angle between the staircase and the floor. [2 marks]

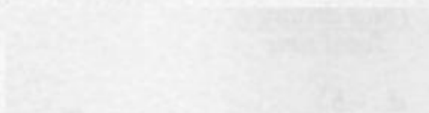
- (b) Seterusnya, hitung panjang, dalam m, pemegang tangan itu. [2 markah]

Hence, calculate the length, in m, of the handrail. [2 marks]

Jawapan / Answer:

(a)

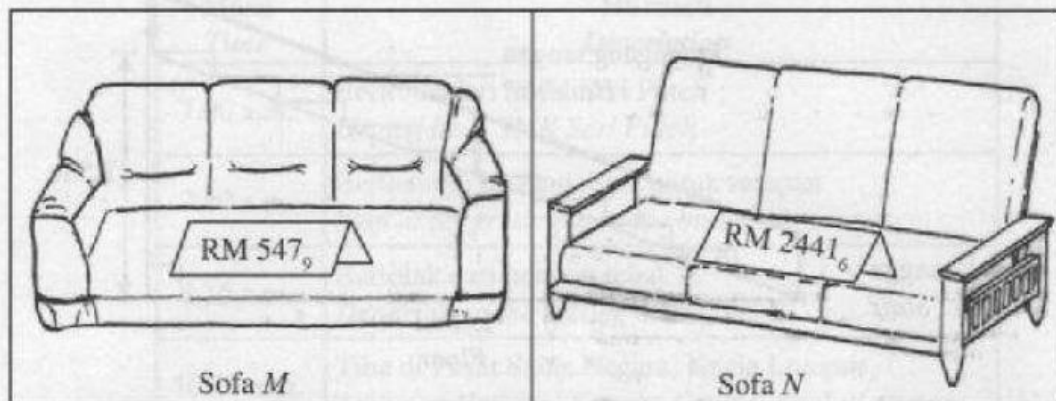
(b)



[Lihat halaman sebelah

SULIT

- 4 Rajah 3 menunjukkan harga bagi dua set sofa dalam dua asas nombor yang berbeza.
Diagram 3 shows the price of two sets of sofa in two different number bases.



Rajah 3
Diagram 3

Tentukan sofa yang lebih murah.

[3 markah]

Determine the cheaper sofa.

[3 marks]

Jawapan / Answer:

- 5 Puan Zakiah, seorang pereka tudung mendapati bahawa bilangan tudung yang dijual, N berubah secara langsung dengan bajet pengiklanan, D dan secara songsang dengan harga sehelai tudung, P . Apabila RM5 000 diperuntukkan untuk iklan dan harga sehelai tudung ialah RM80, didapati bahawa 480 helai tudung telah terjual.

Puan Zakiah, a headscarf designer found that the number of headscarfs sold, N varies directly as the advertising budget, D and inversely as the price of a headscarf, P . When RM5 000 is allocated on advertisement and the price of a headscarf is RM80, it is found that 480 headscarfs were sold.

- (a) Ungkapkan N dalam sebutan D dan P . [2 markah]

Express N in terms of D and P . [2 marks]

- (b) Seterusnya, cari bilangan tudung yang mungkin terjual jika bajet pengiklanan ialah RM75 000 dan harga sehelai tudung tidak berubah. [2 markah]

Hence, find the number of headscarfs that might be sold if the advertising budget is RM75 000 and the price of a headscarf remains the same. [2 marks]

Jawapan / Answer:

(a)

(b)

- 6 (a) Pada tahun 2020, Kamil menerima gaji tahunan sebanyak RM56 000. Dia menderma RM200 kepada perpustakaan negeri pada tahun itu. Jadual 1 menunjukkan pelepasan cukai yang ingin dituntut oleh Kamil.

Kamil received annual salary of RM56 000 in 2020. He donated RM200 to the state library in that year. Table 1 shows the tax reliefs to be claimed by Kamil.

Pelepasan Cukai Tax Relief	Amaun (RM) Amount (RM)
Individu <i>Individual</i>	9 000
Insurans hayat dan KWSP (had RM7 000) <i>Life insurance and EPF (limited to RM7 000)</i>	1 800
Insurans perubatan (had RM3 000) <i>Medical insurance (limited to RM3 000)</i>	3 120

Jadual 1

Table 1

Hitung pendapatan bercukai Kamil pada tahun 2020. [2 markah]

Calculate Kamil's chargeable income in 2020. [2 marks]

- (b) Athar membeli sebuah polisi insurans perubatan dengan fasal penyertaan peratusan ko-insurans 90/10 dan peruntukan deduktibel sebanyak RM2 000. Dia telah menjalani suatu pembedahan di hospital dan kos rawatannya berjumlah RM27 000.

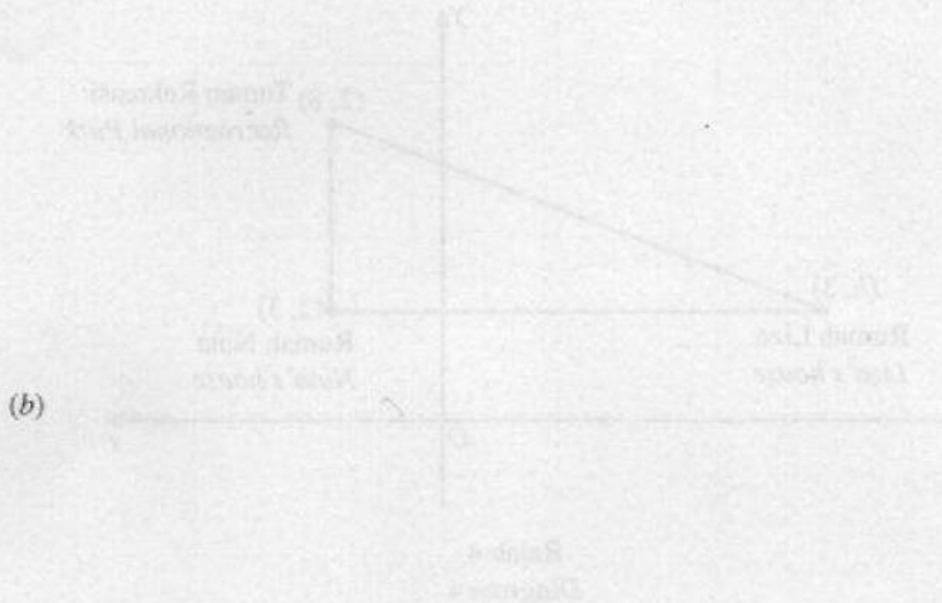
Hitung jumlah kos yang perlu ditanggung oleh Athar. [3 markah]

Athar bought a medical insurance policy with 90/10 co-insurance percentage participation clause and a deductible provision of RM2 000. He underwent a surgery at a hospital and his treatment cost was RM27 000.

Calculate the total cost borne by Athar. [3 marks]

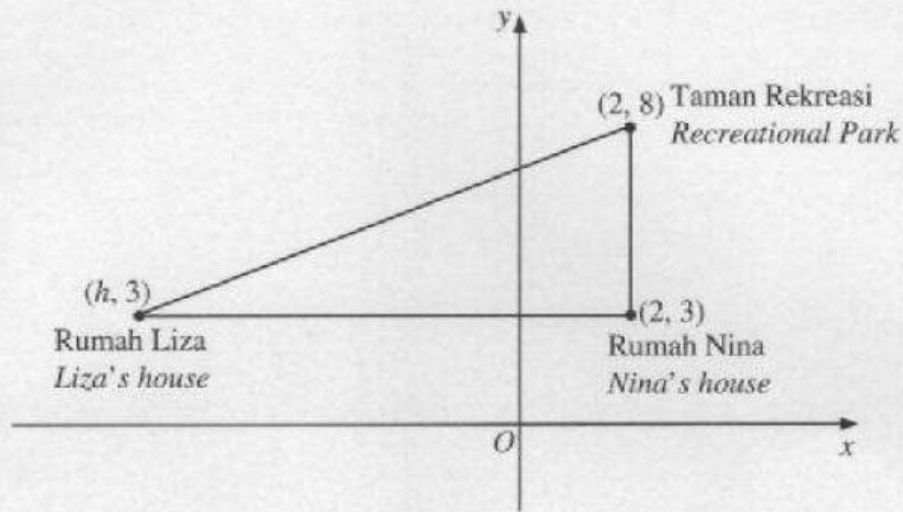
Jawapan / Answer:

(a)



- 7 Rajah 4 menunjukkan kedudukan rumah Liza, rumah Nina dan Taman Rekreasi yang dilukis pada suatu satah Cartes.

Diagram 4 shows the locations of Liza's house, Nina's house and Recreational Park drawn on a Cartesian plane.



Rajah 4
Diagram 4

- (a) Nyatakan persamaan garis lurus yang menghubungkan rumah Liza dan rumah Nina.
[1 markah]

State the equation of the straight line that connects Liza's house and Nina's house.
[1 mark]

- (b) Liza berbasikal dari rumahnya ke Taman Rekreasi yang berjarak 13 km.
Liza cycles from her house to Recreational Park which covers a distance of 13 km.

- (i) Cari nilai h .

Find the value of h .

- (ii) Jalan yang menghubungkan rumah Liza dan Taman Rekreasi adalah selari dengan jalan yang menghubungkan rumah Nina dan sekolah.

Cari persamaan garis lurus yang mewakili jalan dari rumah Nina ke sekolah.

The road that connects Liza's house and Recreational Park is parallel to the road that connects Nina's house and the school.

Find the equation of the straight line that represents the road from Nina's house to the school.

[4 markah]

[4 marks]

SULIT

13

1449/2

Jawapan / Answer:

(a)

Jumlah peratusan		Jumlah nilai	
100%	50%	100%	50%
100%	50%	100%	50%
100%	50%	100%	50%

(b)(i)

(ii)

[Lihat halaman sebelah

SULIT

- 8 Jadual 2 menunjukkan keputusan ujian Matematik kelas 5 Yakin.

Table 2 shows the result of Mathematics test of 5 Yakin.

Murid lelaki Boys		Murid perempuan Girls	
Lulus Passed	Gagal Failed	Lulus Passed	Gagal Failed
x	7	y	5

Jadual 2

Table 2

Diberi bahawa kebarangkalian murid yang gagal ujian itu ialah $\frac{1}{3}$ dan bilangan murid perempuan yang lulus ialah dua kali bilangan murid lelaki yang lulus ujian itu.

Cari nilai x dan nilai y .

[4 markah]

It is given that the probability of students who failed the test is $\frac{1}{3}$ and the number of girls who passed is twice the number of boys who passed the test.

Find the value of x and of y .

[4 marks]

Jawapan / Answer:

- 9 (a) Muaz bekerja sebagai seorang pegawai sains di sebuah hospital. Pendapatan dan perbelanjaan bulanannya masing-masing ialah RM3 200 dan RM1 950. Dia merancang untuk membeli sebuah motosikal yang berharga RM14 400 secara tunai dalam tempoh setahun.

Adakah Muaz akan mencapai matlamat kewangannya? Jelaskan. [2 markah]

Muaz works as a science officer in a hospital. His monthly income and expenses are RM3 200 and RM1 950 respectively. He plans to buy a motorcycle that costs RM14 400 in cash within a year.

Will Muaz achieve his financial goal? Explain. [2 marks]

- (b) Jozef merupakan seorang pensyarah muda di sebuah kolej swasta dan dia menerima pendapatan bulanan sebanyak RM4 000. Ketika waktu lapang, dia bekerja sebagai tutor persendirian dan pemandu e-hailing. Pada suatu bulan tertentu, Jozef mempunyai perbelanjaan tetap dan tidak tetap sebanyak RM3 200.

Jika Jozef mempunyai aliran tunai positif sebanyak RM1 850 pada bulan tersebut, hitung pendapatannya yang diperoleh dari kerja sampingan. [2 markah]

Jozef is a young lecturer in a private college and he receives a monthly income of RM4 000. During his free time, he works as a private tutor and an e-hailing driver. In a particular month, Jozef has a fixed and variable expenses of RM3 200.

If Jozef has a positive cash flow of RM1 850 in that month, calculate his income earned from the part time job. [2 marks]

Jawapan / Answer:

(a)

(b)