NAMA: …….……. TINGKATAN: ……..

SMK DATOK LOKMAN
PETAKSIRAN PERCUBAAN SPM 2021

MATEMATIK
KERTAS 2
(1449/2)

Dua jam tiga puluh minit

JANGAN BUKA MODUL INI SEHINGGA DIBERITAHU

1 *Tulis* **nama** *dan* **tingkatan** *anda pada ruang yang disediakan.*

2 *Modul ini adalah dalam dwibahasa.*

3 *Soalan dalam bahasa Melayu mendahului soalan yang sepadan dalam bahasa Inggeris.*

4 *Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Melayu atau bahasa Inggeris.*

Untuk Kegunaan Pemeriksa			
Bahagian	Soalan	Markah Penuh	Markah diperoleh
A	**1**	4	
	2	4	
	3	4	
	4	4	
	5	3	
	6	4	
	7	5	
	8	4	
	9	3	
	10	5	
B	**11**	9	
	12	9	
	13	9	
	14	9	
	15	9	
C	**16**	15	
Jumlah			

Soalan ini mengandungi **32** halaman bercetak.

LIVEWORKSHEETS

RUMUS MATEMATIK
MATHEMATICAL FORMULAE

Rumus-rumus berikut boleh membantu anda untuk 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

NOMBOR DAN OPERASI
NUMBERS AND OPERATIONS

1 $a^m \times a^n = a^{m+n}$

2 $a^m \div a^n = a^{m-n}$

3 $(a^m)^n = a^{mn}$

4 $a^{\frac{m}{n}} = (a^m)^{\frac{1}{n}}$

5 Faedah mudah / *Simple interest*, $I = Prt$

6 Nilai matang/*Maturity value*, $MV = P\left(1 + \frac{r}{n}\right)^{nt}$

7 Jumlah bayaran balik / *Total repayment*, $A = P + Prt$

PERKAITAN
RELATIONS

1 Jarak / *Distance* = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

2 Titik Tengah / *midpoint* $(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

3 Purata laju = $\frac{\text{jarak yang dilalui}}{\text{masa yang diambil}}$

Average speed = $\frac{\textit{distance travelled}}{\textit{time taken}}$

4 $m = \frac{y_2 - y_1}{x_2 - x_1}$

5 $m = -\frac{\text{pintasan-}y}{\text{pintasan-}x}$

$m = -\frac{y\text{-intercept}}{x\text{-intercept}}$

6 $A^{-1} = \frac{1}{ad - bc}\begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$

LIVEWORKSHEETS

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 $= \pi j^2$
Area of circle $= \pi r^2$

5 $\dfrac{\text{Panjang lengkok}}{2\pi j} = \dfrac{\theta}{360^\circ}$
$\dfrac{\text{Arc length}}{2\pi r} = \dfrac{\theta}{360^\circ}$

6 $\dfrac{\text{Luas sektor}}{\pi j^2} = \dfrac{\theta}{360^\circ}$
$\dfrac{\textit{Area of sector}}{\pi r^2} = \dfrac{\theta}{360^\circ}$

7 Luas lelayang $= \dfrac{1}{2} \times$ hasil darab panjang dua pepenjuru
$\textit{Area of kite} = \dfrac{1}{2} \times \textit{product of two diagonals}$

8 Luas trapezium $= \dfrac{1}{2} \times$ hasil tambah dua sisi selari $\times$ tinggi
Area of trapezium $= \dfrac{1}{2} \times$ *sum of 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 Isipadu prisma tegak = luas keratan rentas $\times$ tinggi
Volume of right prism = cross sectional area × height

13 Isipadu silinder $= \pi j^2 t$
Volume of cylinder $= \pi r^2 h$

LIVEWORKSHEETS

14 Isipadu kon = $\frac{1}{3}\pi j^2 t$

Volume of cone = $\frac{1}{3}\pi r^2 h$

15 Isipadu sfera = $\frac{4}{3}\pi j^3$

Volume of sphere = $\frac{4}{3}\pi r^3$

16 Isipadu piramid tegak $= \frac{1}{3} \times$ luas tapak $\times$ tinggi

Volume of right pyramid = $\frac{1}{3} \times$ *base area* $\times$ *height*

17 Faktor skala, $k = \frac{PA'}{PA}$

Scale factor, $k = \frac{PA'}{PA}$

18 Luas imej = $k^2 \times$ luas objek
Area of image = $k^2 \times$ *area of object*

STATISTIK DAN KEBARANGKALIAN
STATISTICS AND PROBABILITY

1 Min / *Mean*, $\bar{x} = \frac{\sum x}{N}$

2 Min / *Mean*, $\bar{x} = \frac{\sum fx}{f}$

3 Varians / *Variance*, $\sigma^2 = \frac{\sum (x-\bar{x})^2}{N} = \frac{\sum x^2}{N} - \bar{x}^2$

4 Varians / *Variance*, $\sigma^2 = \frac{\sum f(x-\bar{x})^2}{f} = \frac{\sum fx^2}{f} - \bar{x}^2$

5 Sisihan piawai / *Standard deviation*, $\sigma = \sqrt{\frac{\sum (x-\bar{x})^2}{N}} = \sqrt{\frac{\sum x^2}{N} - \bar{x}^2}$

6 Sisihan piawai / *Standard deviation*, $\sigma = \sqrt{\frac{\sum f(x-\bar{x})^2}{f}} = \sqrt{\frac{\sum fx^2}{f} - \bar{x}^2}$

7 $P(A) = \frac{n(A)}{n(S)}$

8 $P(A') = 1 - P(A)$

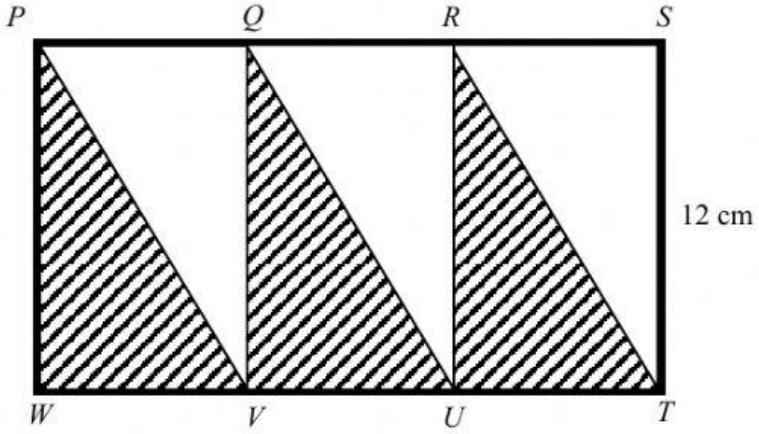
LIVEWORKSHEETS

Bahagian A
***Section* A**
[40 markah]
[40 *marks*]

Jawab **semua** soalan dalam bahagian ini.
Answer **all** *questions in this section.*

1. Rajah 1 di bawah menunjukkan sekeping kertas dinding berbentuk segi empat tepat dengan corak beberapa segitiga bersudut tegak yang sama saiz di atasnya.

Diagram 1 *below shows a piece of rectangular wallpaper with a pattern of several right-angled triangles of the same size on it.*



Rajah / *Diagram* 1

Diberi $PS = 102_5$ cm, hitung perimeter kawasan berlorek dalam asas 7.
Given $PS = 102_5$ cm, *calculate the perimeter of the shaded area in base* 7.

[4 markah / *marks*]

Jawapan / *Answer*:

$PS = 102_5 =$ _____$_{10}$

$PQ = QR = RS =$ _____cm

$PV = QU = RT = \sqrt{\quad^2 + \quad^2} =$ _____cm

Perimeter Kawasan berlorek = _____cm

Perimeter Kawasan berlorek dalam asas 7 = _____$_7$

LIVEWORKSHEETS

2 Selesaikan persamaan kuadratik berikut:

Solve the following quadratic equation:

$$-2x(x+3) = -8$$

[4 markah / *marks*]

Jawapan / *Answer* :

" Drag " jawapan ke dalam petak.

$-2x^2 - 6x = -8$	$x = 1\ ,\ x = -4$
$(x-1)(x+4) = 0$	$-2x^2 - 6x + 8 = 0$
$x^2 + 3x - 4 = 0$	

3 (*a*) Nyatakan sama ada setiap pernyataan berikut adalah **benar** atau **palsu**.

State each of the following statements is ***true*** *or* ***false****.*

(i) $5^2 = 10$ atau / *or* $\frac{5}{2} = 2.5$

(ii) $(-5) \times (-2) = 10$ dan / *and* $-5 > -2$

(*b*) Tulis dua implikasi berdasarkan pernyataan berikut:

Write down two implications based on the following compound statement:

$m > n$ *jika dan hanya jika* $m+1 > n+1$
$m > n$ if and only if $m+1 > n+1$

[4 markah / *marks*]

Jawapan / *Answer*:

(*a*) (i)

(ii)

(*b*) Implikasi / *Implication* 1 :

LIVEWORKSHEETS

Implikasi / *Implication* 2 :

4 (*a*) Set A ialah set nombor genap dan set B ialah set gandaan 3. Lengkapkan gambar rajah Venn di ruang jawapan untuk menunjukkan hubungan di antara set A dan set B.

Set A is a set of an even number and set B is a set of a multiple of 3. *Complete the Venn diagram in the answer space to show the relation between set A and set B.*

[Tick pada pilihan jawapan]

(*b*) Diberi tiga set, P, Q dan R dengan keadaan set semesta, $\xi = P \cup Q \cup R$, $P \cap Q = \varnothing$ dan $P \cup Q \subset R$. Lukis gambar rajah Venn di ruang jawapan untuk menunjukkan hubungan di antara set P, set Q dan set R.

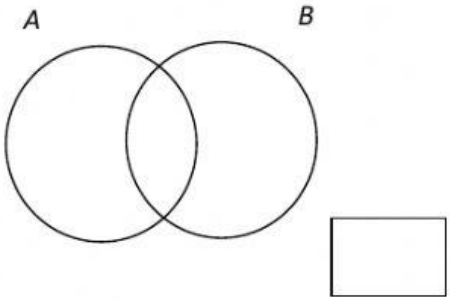
Given three sets, P, Q and R with the universal set $\xi = P \cup Q \cup R$, $P \cap Q = \varnothing$ *and* $P \cup Q \subset R$. *Draw a Venn diagram in the answer space to show the relation between set P, Q and R.*

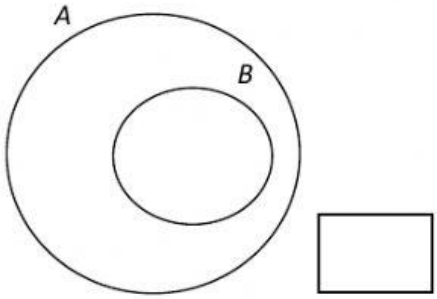
[Tick pada pilihan jawapan]

[4 markah / *marks*]

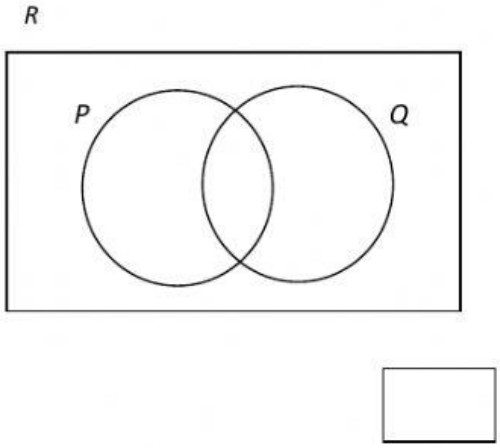
Jawapan / *Answer*:

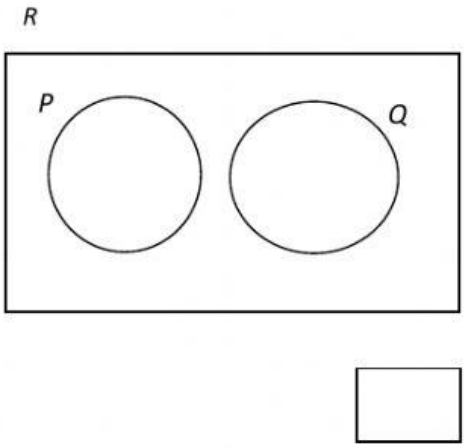
(*a*)





(*b*)





LIVEWORKSHEETS

5 Berdasarkan maklumat berikut, lengkapkan rangkaian dalam Rajah 5 di ruang jawapan bagi perjumpaan 6 orang rakan ini dalam tempoh lima hari

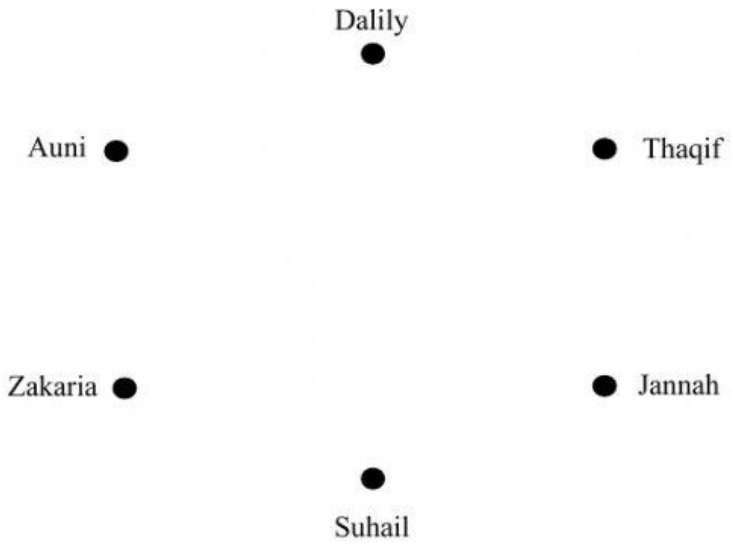
Based on the following information, complete the network in Diagram 5 *in the answer space for the meeting of these* 6 *friends within five days*

Pada hari pertama Auni telah berjumpa dengan Dalily dan Thaqif.
Pada hari kedua, Dalily juga berjumpa dengan Thaqif dan Jannah.
Pada hari ketiga, Thaqif telah berjumpa dengan Suhail.
Pada esoknya, Suhail pula berjumpa Auni dan Jannah.
Pada hari terakhir, Jannah telah pergi berjumpa Zakaria

On the first day Auni had met Dalily and Thaqif.
On the second day, Dalily also met Thaqif and Jannah.
On the third day, Thaqif met Suhail.
The next day, Suhail met Auni and Jannah.
On the last day, Jannah went to see Zakaria

[3 markah / *marks*]

Jawapan / *Answer*:



Rajah / *Diagram* 5

LIVEWORKSHEETS

6 (*a*) Pada Rajah 6 di bawah, menunjukkan lorekkan rantau yang memuaskan keempat-empat ketaksamaan $y > x$, $2y \geq 6 - 3x$, $x + y \leq 10$ dan $x \geq 0$.

In Diagram 6 *below, shade the region which satisfies all four inequalities* $y > x$, $2y \geq 6 - 3x$, $x + y \leq 10$ *and* $x \geq 0$. Tentukan sama ada titik-titik berikut memuaskan atau tidak memuaskan sistem ketaksamaan tersebut:

[Drag titik ke dalam petak memuaskan atau tidak memuaskan]

(4,4)	(1,7)	(0,10)

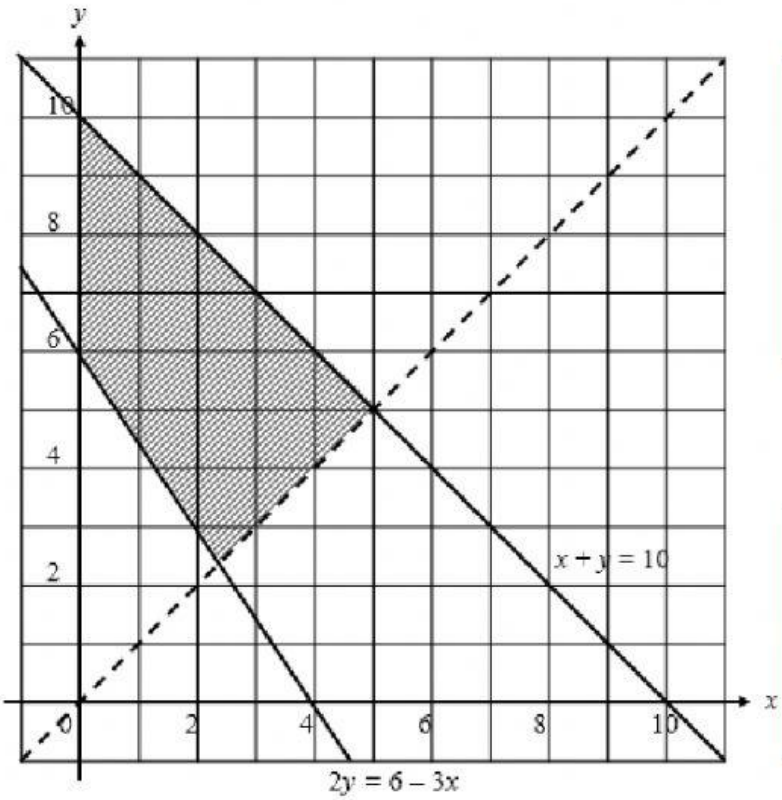
(*b*) Berdasarkan Rajah 6 di (*a*), diberi julat $p \leq y \leq q$ apabila $x = 2$. Nyatakan nilai p dan q tersebut.

Based on Diagram 6 *di* (*a*), *given the range* $p \leq y \leq q$ *when* $x = 2$. *State the value of p and the value of q.*

[4 markah / *marks*]

Jawapan / *Answer*:

(*a*)



MEMUASKAN

TIDAK MEMUASKAN

Rajah / *Diagram* 6

p =	q =

LIVEWORKSHEETS