



**MAKTAB RENDAH SAINS MARA**

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**PEPERIKSAAN AKHIR SIJIL PENDIDIKAN MRSM 2018**

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**MATEMATIK**

Kertas 1

Satu jam lima belas minit

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**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU**

1. *Kertas soalan ini adalah dalam dwibahasa.*
2. *Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.*
3. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

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Kertas soalan ini mengandungi 35 halaman bercetak dan 1 halaman tidak bercetak.

**MATHEMATICAL FORMULAE**  
**RUMUS MATEMATIK**

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

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

**RELATIONS**  
**PERKAITAN**

- |   |   |
|---|---|
| <p>1 <math>a^m \times a^n = a^{m+n}</math></p>  | <p>10 Pythagoras Theorem<br/><i>Teorem Pithagoras</i><br/><math>c^2 = a^2 + b^2</math></p>  |
| <p>2 <math>a^m \div a^n = a^{m-n}</math></p>  | <p>11 <math>P(A) = \frac{n(A)}{n(S)}</math></p>   |
| <p>3 <math>(a^m)^n = a^{mn}</math></p>  | <p>12 <math>P(A') = 1 - P(A)</math></p>   |
| <p>4 <math>A^{-1} = \frac{1}{ad - bc} \begin{pmatrix} d &amp; -b \\ -c &amp; a \end{pmatrix}</math></p>   | <p>13 <math>m = \frac{y_2 - y_1}{x_2 - x_1}</math></p>  |
| <p>5 Distance / <i>Jarak</i><br/><math>= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}</math></p>  | <p>14 <math>m = -\frac{y\text{-intercept}}{x\text{-intercept}}</math><br/><math>m = -\frac{\text{pintasan } y}{\text{pintasan } x}</math></p> |
| <p>6 Midpoint / <i>Titik tengah</i><br/><math>(x, y) = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)</math></p>   |   |
| <p>7 Average speed = <math>\frac{\text{distance travelled}}{\text{time taken}}</math><br/><i>Purata laju = <math>\frac{\text{jarak yang dilalui}}{\text{masa yang diambil}}</math></i></p>  |   |
| <p>8 Mean = <math>\frac{\text{sum of data}}{\text{number of data}}</math><br/><br/><math>\text{Min} = \frac{\text{hasil tambah nilai data}}{\text{bilangan data}}</math></p>  |   |
| <p>9 Mean = <math>\frac{\text{sum of (midpoint} \times \text{frequency)}}{\text{sum of frequencies}}</math><br/><br/><math>\text{Min} = \frac{\text{hasil tambah (nilai titik tengah kelas} \times \text{kekerapan)}}{\text{hasil tambah kekerapan}}</math></p> |   |

**SHAPES AND SPACE**  
**BENTUK DAN RUANG**

- 1 Area of trapezium =  $\frac{1}{2} \times \text{sum of parallel sides} \times \text{height}$   
*Luas trapezium =  $\frac{1}{2} \times \text{hasil tambah dua sisi selari} \times \text{tinggi}$*
- 2 Circumference of circle =  $\pi d = 2\pi r$   
*Lilitan bulatan =  $\pi d = 2\pi j$*
- 3 Area of circle =  $\pi r^2$   
*Luas bulatan =  $\pi j^2$*
- 4 Curved surface area of cylinder =  $2\pi rh$   
*Luas permukaan melengkung silinder =  $2\pi jt$*
- 5 Surface area of sphere =  $4\pi r^2$   
*Luas permukaan sfera =  $4\pi j^2$*
- 6 Volume of right prism = cross sectional area  $\times$  length  
*Isi padu prisma tegak = luas keratan rentas  $\times$  panjang*
- 7 Volume of cylinder =  $\pi r^2 h$   
*Isi padu silinder =  $\pi j^2 t$*
- 8 Volume of cone =  $\frac{1}{3} \pi r^2 h$   
*Isi padu kon =  $\frac{1}{3} \pi j^2 t$*
- 9 Volume of sphere =  $\frac{4}{3} \pi r^3$   
*Isi padu sfera =  $\frac{4}{3} \pi j^3$*
- 10 Volume of right pyramid =  $\frac{1}{3} \times \text{base area} \times \text{height}$   
*Isi padu piramid tegak =  $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$*
- 11 Sum of interior angles of a polygon  
*Hasil tambah sudut pedalaman poligon*  
 $= (n - 2) \times 180^\circ$

$$12 \quad \frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$

$$\frac{\text{panjang lengkok}}{\text{lilitan bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$$

$$13 \quad \frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$

$$\frac{\text{luas sektor}}{\text{luas bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$$

$$14 \quad \text{Scale factor, } k = \frac{PA'}{PA}$$

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

$$15 \quad \text{Area of image} = k^2 \times \text{area of object}$$

$$\text{Luas imej} = k^2 \times \text{luas objek}$$

- 1 Which of the following numbers is **not** equal to 26.0 when rounded off correct to three significant figures?

*Antara berikut yang manakah tidak sama dengan 26.0 apabila dibundarkan betul kepada tiga angka bererti?*

A 25.43

B 25.95

C 25.99

D 26.03

- 2 Given  $X = 5 \times 10^{-3}$ , what is the value of  $Y$  if  $X + Y = 0.019$ ?

*Diberi  $X = 5 \times 10^{-3}$ , apakah nilai  $Y$  jika  $X + Y = 0.019$ ?*

A  $1.4 \times 10^{-1}$

B  $1.4 \times 10^{-2}$

C  $1.4 \times 10^{-3}$

D  $1.4 \times 10^{-4}$

- 3 Diagram 1 shows an empty cone with height 20 cm and its diameter of 30 cm.

*Rajah 1 menunjukkan sebuah kon kosong dengan tinggi 20 cm dan diameternya ialah 30 cm.*

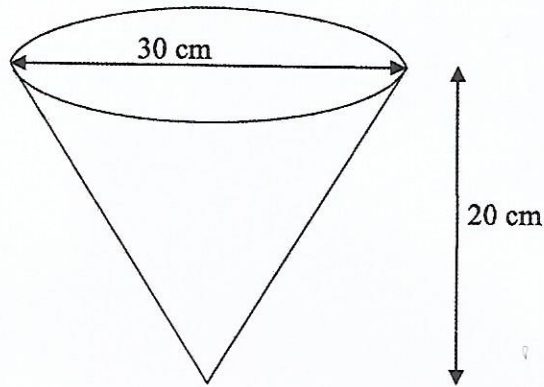


Diagram 1  
*Rajah 1*

If the cone is 70% filled up with water, calculate the volume, in  $\text{cm}^3$ , of the water.

*Jika 70% kon tersebut dipenuhi dengan air, kirakan isipadu, dalam  $\text{cm}^3$ , air tersebut.*

- A  $3.5 \times 10^3$
- B  $4.7 \times 10^3$
- C  $1.3 \times 10^4$
- D  $1.9 \times 10^4$

- 4 Mass for one hydrogen atom is  $1.66 \times 10^{-24}$  g and mass for one oxygen atom is  $2.66 \times 10^{-23}$  g. Calculate the mass, in g, of one molecule of water that consist of 2 hydrogen atom and 1 oxygen atom.

*Jisim bagi satu atom hidrogen ialah  $1.66 \times 10^{-24}$  g dan jisim bagi satu atom oksigen ialah  $2.66 \times 10^{-23}$  g. Hitung jisim, dalam g, bagi satu molekul air yang terdiri daripada 2 atom hidrogen dan 1 atom oksigen.*

- A  $2.99 \times 10^{-23}$
- B  $8.83 \times 10^{-47}$
- C  $5.48 \times 10^{-23}$
- D  $4.42 \times 10^{-47}$
- 5 What is the place value of the digit 2 in the number  $7235_8$ ?  
*Apakah nilai tempat bagi digit 2 dalam nombor  $7235_8$ ?*
- A 2
- B 64
- C 128
- D 512

- 6 Given  $x - 43_5 = 402_5$ , find the value of  $x$  in base ten.

*Diberi  $x - 43_5 = 402_5$ , cari nilai  $x$  dalam asas sepuluh.*

- A 1000
- B 625
- C 445
- D 125

- 7 In Diagram 2,  $PQRS$  is a rhombus.

*Dalam Rajah 2,  $PQRS$  ialah sebuah rombus.*

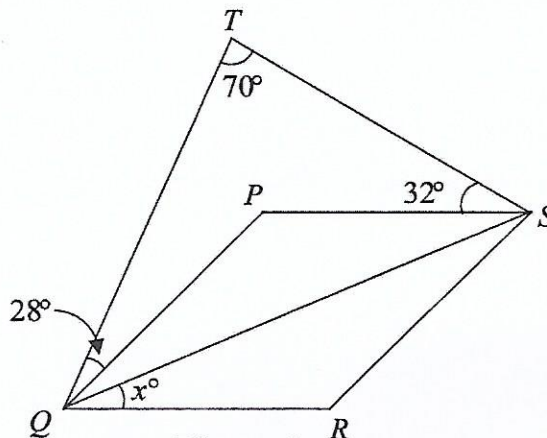


Diagram 2  
Rajah 2

Find the value of  $x$ .

*Cari nilai  $x$ .*

- A 25
- B 35
- C 50
- D 65



- 8 In Diagram 3,  $PQR$  and  $PT$  are tangents to the circle  $QST$  at  $Q$  and  $T$  respectively.  $RST$  is a straight line.

*Dalam rajah 3,  $PQR$  dan  $PT$  masing-masing ialah tangen kepada bulatan  $QST$  di  $Q$  dan  $T$ .  $RST$  ialah garis lurus.*

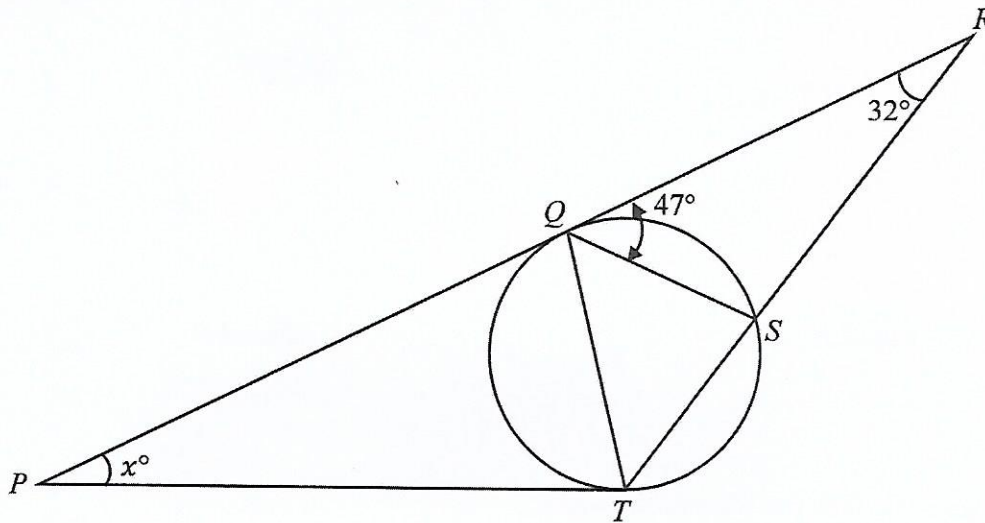


Diagram 3  
Rajah 3

The value of  $x$  is

Nilai  $x$  ialah

- A  $22^\circ$
- B  $26^\circ$
- C  $32^\circ$
- D  $47^\circ$

- 9 In Diagram 4, Rimau  $F$  is the image of Rimau  $E$  under an enlargement.  
 Dalam Rajah 4, Rimau  $F$  ialah imej Rimau  $E$  di bawah satu pembesaran.

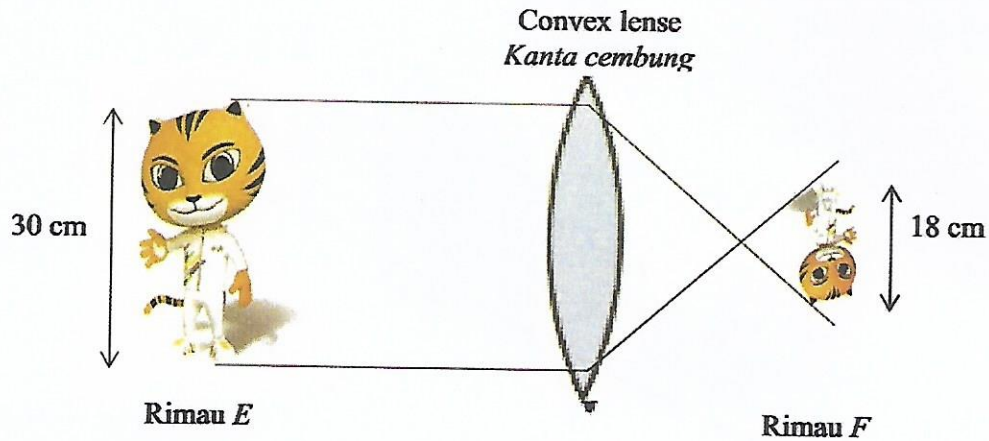


Diagram 4  
Rajah 4

What is the scale factor of the enlargement?

Apakah faktor skala pembesaran itu?

- A  $\frac{5}{3}$   
 B  $\frac{3}{5}$   
 C  $-\frac{3}{5}$   
 D  $-\frac{5}{3}$

- 10 In Diagram 5,  $JKL$  and  $LMN$  are straight lines.  
 Dalam Rajah 5,  $JKL$  dan  $LMN$  ialah garis lurus.

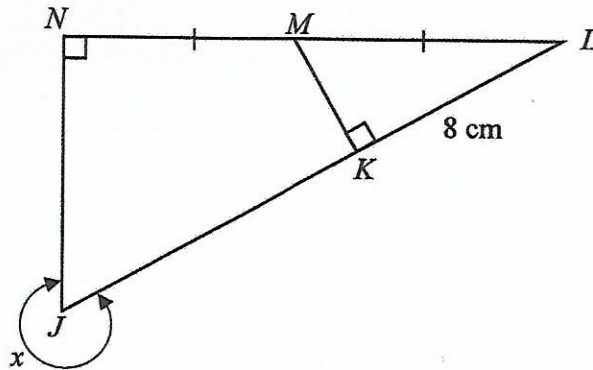


Diagram 5  
Rajah 5

Given  $\cos \angle KLM = \frac{4}{5}$ , find the value of  $\tan x$ .

Diberi  $\cos \angle KLM = \frac{4}{5}$ , cari nilai  $\tan x$ .

- A  $\frac{4}{3}$   
 B  $-\frac{4}{3}$   
 C  $\frac{2}{3}$   
 D  $-\frac{2}{3}$

- 11 Determine the number of intersection point(s) between the graph  $y = \sin x$  and  $y = \cos x$  for  $90^\circ \leq x \leq 360^\circ$ . Hence, state the value(s) of  $x$ .

*Tentukan bilangan titik persilangan antara graf  $y = \sin x$  dan  $y = \cos x$  bagi  $90^\circ \leq x \leq 360^\circ$ . Seterusnya, nyatakan nilai  $x$ .*

	Intersection point(s) <i>Titik persilangan</i>	$x$
A	1	$45^\circ$
B	1	$225^\circ$
C	2	$90^\circ, 180^\circ$
D	2	$45^\circ, 225^\circ$

- 12 Diagram 6 shows a solid with the horizontal base  $DEFG$ .  
 $DEIH$ ,  $EFJI$ ,  $FGKJ$  and  $DGKH$  are vertical planes.

Rajah 6 menunjukkan sebuah pepejal dengan tapak mengufuk  $DEFG$ .  
 $DEIH$ ,  $EFJI$ ,  $FGKJ$  dan  $DGKH$  ialah satah tegak.

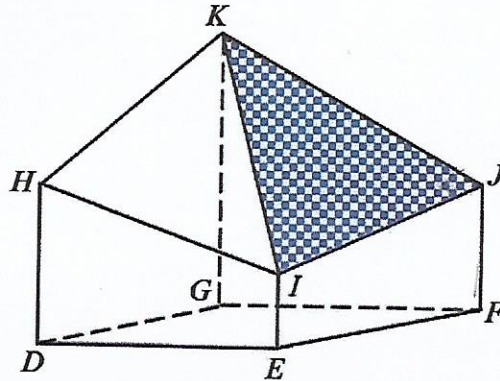


Diagram 6  
 Rajah 6

Name the angle between the plane  $KIJ$  and the plane  $FGKJ$ .  
 Namakan sudut di antara satah  $KIJ$  dengan satah  $FGKJ$ .

- A  $\angle GKI$   
 B  $\angle IJF$   
 C  $\angle GJI$   
 D  $\angle IKF$

- 13 Diagram 7 shows the position of a cable car, the cable car station and a bird.

*Rajah 7 menunjukkan kedudukan sebuah kereta kabel, stesen kereta kabel dan seekor burung.*

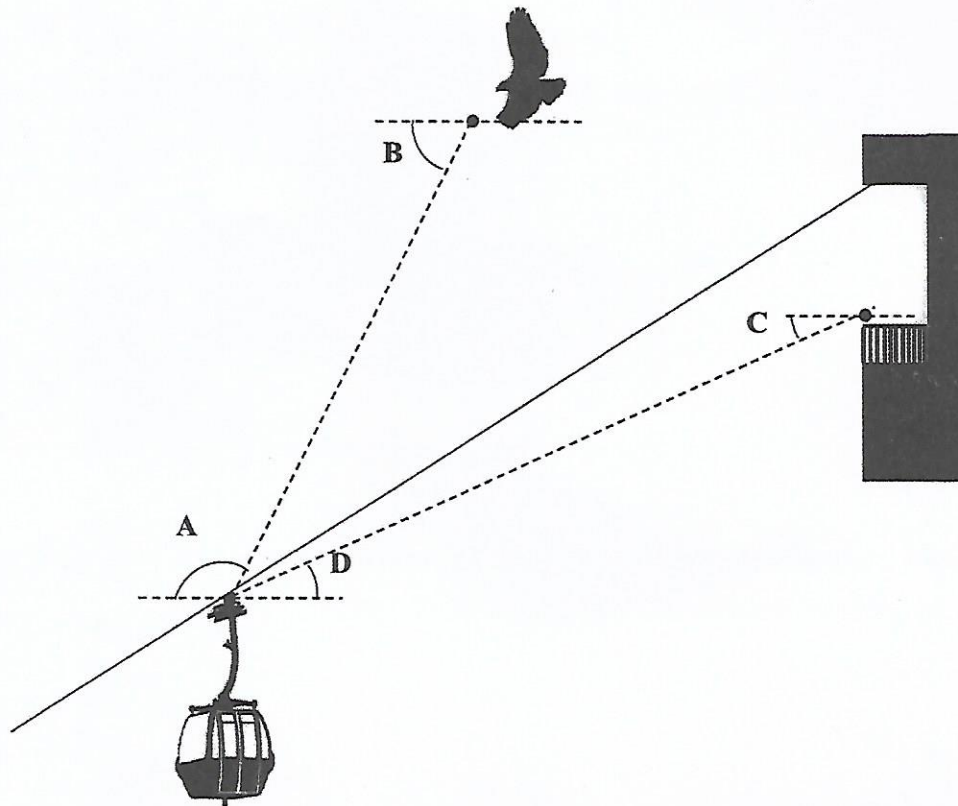


Diagram 7  
Rajah 7

Which of the following, A, B, C or D represents the angle of elevation?

*Antara A, B, C atau D, yang manakah mewakili sudut dongakan?*

- 14 Diagram 8 shows a lighthouse is in between a boat and a buoy. The lighthouse, the boat and the buoy are collinear.

*Rajah 8 menunjukkan sebuah rumah api berada di antara sebuah bot dan sebuah pelampung. Rumah api, bot dan pelampung itu adalah segaris.*

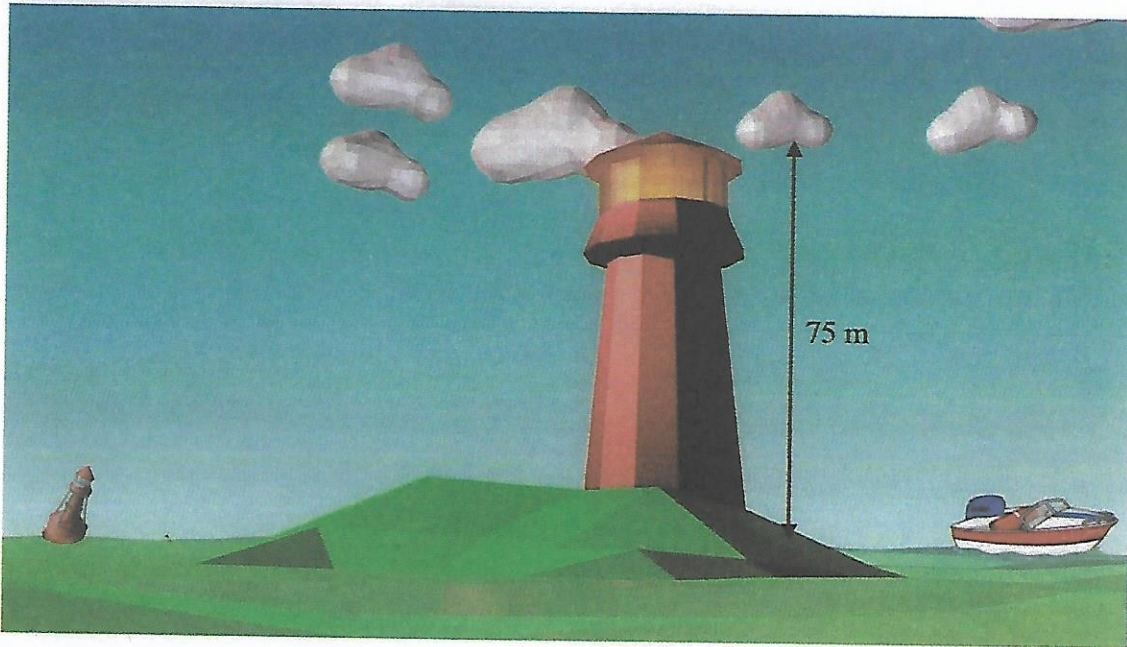


Diagram 8  
Rajah 8

Given that the angles of depression of the buoy and the boat from the top of the lighthouse are  $30^\circ$  and  $40^\circ$  respectively. Find the distance, in m, between the buoy and the boat.

*Diberi sudut tunduk pelampung dan bot dari puncak rumah api masing-masing ialah  $30^\circ$  dan  $40^\circ$ . Cari jarak, dalam m, di antara pelampung dan bot.*

- A 89.4
- B 106.2
- C 129.9
- D 219.3

- 15 Diagram 9 shows the locations of Market, Clinic and Post Office in a certain town. Clinic is due south of Market. The bearing of Post Office from Market and Post Office from Clinic are  $138^\circ$  and  $104^\circ$  respectively.

*Rajah 9 menunjukkan lokasi Pasar, Klinik dan Pejabat Pos di sebuah bandar. Klinik berada di selatan Pasar. Bearing Pejabat Pos dari Pasar dan Pejabat Pos dari Klinik masing-masing ialah  $138^\circ$  dan  $104^\circ$ .*

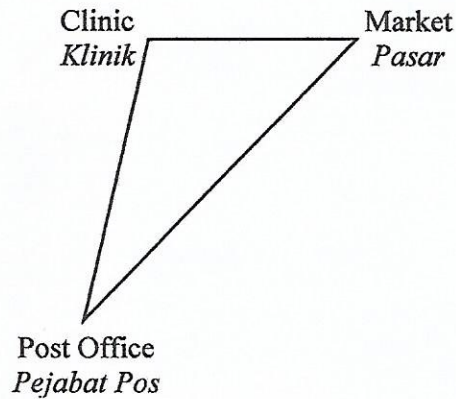


Diagram 9  
Rajah 9

Find the bearing of Clinic from Post Office.

*Cari bearing Klinik dari Pejabat Pos.*

- A  $034^\circ$
- B  $138^\circ$
- C  $284^\circ$
- D  $318^\circ$



- 16 A yacht leaves  $Q$  to  $P$  which is at a bearing of  $100^\circ$  from  $Q$ . Then, it continues its journey to  $R$  which is at bearing of  $230^\circ$  from  $P$ . Given that  $\angle QRP = 30^\circ$ , find the bearing of  $R$  from  $Q$ .

*Sebuah kapal layar meninggalkan  $Q$  ke  $P$  yang berada pada bearing  $100^\circ$  dari  $Q$ . Kemudian kapal layar itu meneruskan perjalanan ke  $R$  yang berada pada bearing  $230^\circ$  dari  $P$ . Diberi  $\angle QRP = 30^\circ$ , cari bearing  $R$  dari  $Q$ .*

- A  $100^\circ$   
 B  $160^\circ$   
 C  $180^\circ$   
 D  $200^\circ$

- 17 In Diagram 10,  $NOS$  is the axis of the earth.  $CD$  is a diameter of the parallel of latitude. Dalam Rajah 10,  $UOS$  ialah paksi bumi.  $CD$  ialah diameter selarian latitud.

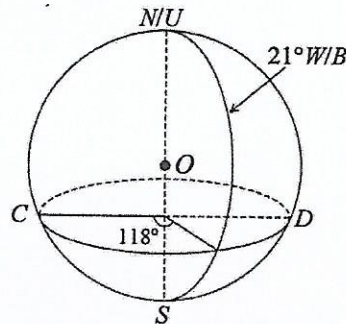


Diagram 10  
Rajah 10

Find the longitude of  $D$ .

*Cari longitud  $D$ .*

- A  $41^\circ E$   
 $41^\circ T$   
 B  $62^\circ E$   
 $62^\circ T$   
 C  $83^\circ E$   
 $83^\circ T$   
 D  $139^\circ E$   
 $139^\circ T$

- 18 Simplify  $(m+2)(m-3)-m^2+2m$   
*Permudahkan  $(m+2)(m-3)-m^2+2m$*
- A  $-m+6$
- B  $-m-6$
- C  $m+6$
- D  $m-6$
- 19 Factorise completely for  $-48+147x^2$ .  
*Faktorkan selengkapnya bagi  $-48+147x^2$ .*
- A  $3(49x^2-16)$
- B  $3(16-49x^2)$
- C  $3(7x-4)(7x+4)$
- D  $3(4-7x)(4+7x)$
- 20 Given that  $1=5-\frac{2x}{3}$ , calculate the value of  $x$ .  
*Diberi  $1=5-\frac{2x}{3}$ , hitung nilai  $x$ .*
- A 1
- B 2
- C 6
- D 9

21 Simplify :

*Ringkaskan:*

$$(3)^{-2} \times (81p^8)^{\frac{3}{4}} \div \left(\frac{9}{49}p^{-2}\right)^{\frac{1}{2}}$$

A  $49p^7$

B  $49p^5$

C  $7p^7$

D  $7p^5$

22 Given that  $\frac{(s^6t^3)^{\frac{2}{3}}}{(st)^2 \times s^2} = 8r^3$ , find the value of  $r$ .

*Diberi  $\frac{(s^6t^3)^{\frac{2}{3}}}{(st)^2 \times s^2} = 8r^3$ , cari nilai  $r$ .*

A  $\frac{1}{8}$

B  $\frac{1}{2}$

C 2

D 8

- 23 Given that  $k = \frac{1}{2} \left( \sqrt[5]{\frac{m}{n}} \right)$ , express  $m$  in terms of  $k$  and  $n$ .

Diberi  $k = \frac{1}{2} \left( \sqrt[5]{\frac{m}{n}} \right)$ , ungkapkan  $m$  dalam sebutan  $k$  dan  $n$ .

A  $m = (2k)^5 n$

B  $m = 2k^5 n$

C  $m = 32k^5 n$

D  $m = 10k^5 n$

- 24 List all the integers  $w$  which satisfy both the simultaneous linear inequalities  $-2w + 5 \leq 3$  and  $\frac{3w}{2} - 5 < 7$ .

Senaraikan semua integer  $w$  yang memuaskan kedua-dua ketaksamaan linear serentak  $-2w + 5 \leq 3$  dan  $\frac{3w}{2} - 5 < 7$ .

A 1, 2, 3, 4, 5, 6, 7, 8

B 2, 3, 4, 5, 6, 7

C 1, 2, 3, 4, 5, 6, 7

D 2, 3, 4, 5, 6, 7, 8

- 25 The ogive in Diagram 11 represents the temperature ( $T$ ) of 60 different samples.  
*Ogif dalam Rajah 11 menunjukkan suhu ( $S$ ) bagi 60 sampel yang berlainan.*

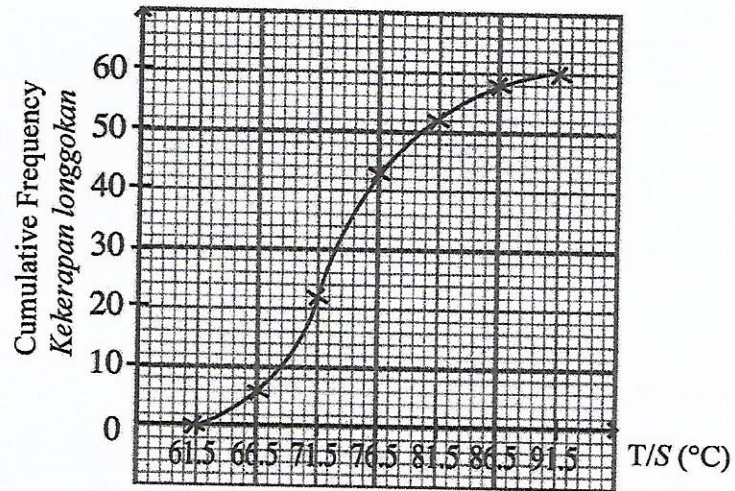


Diagram 11

Rajah 11

The modal class is

*Kelas mod ialah*

- A 86.5 – 91.5
- B 87 – 91
- C 71.5 – 76.5
- D 72 – 76

- 26 Diagram 12 is a pie chart showing the favourites food chosen by a number of students.  
*Rajah 12 ialah sebuah carta pai menunjukkan pilihan makanan kegemaran bagi beberapa orang murid.*

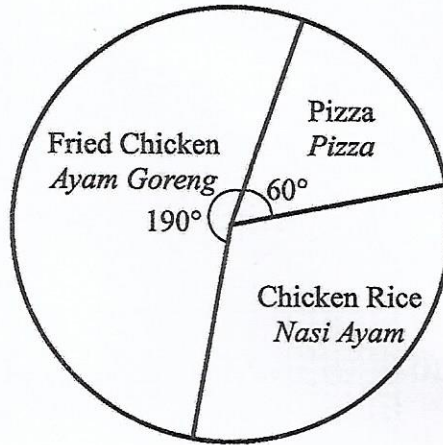
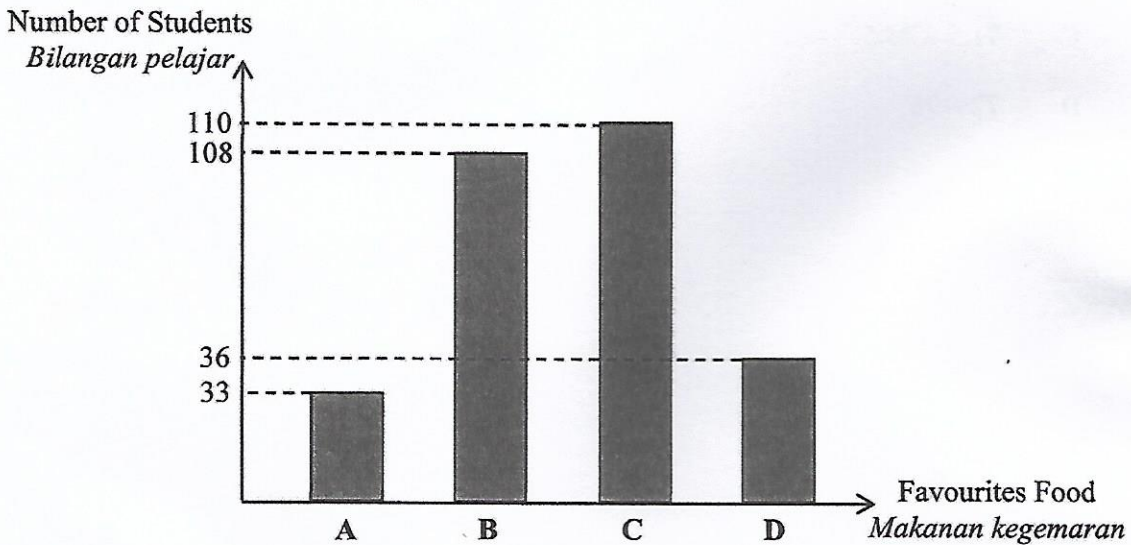


Diagram 12  
*Rajah 12*

Given 57 students chose the Fried Chicken as their favourite. Which of the following bars, A, B, C or D represents those who chose the Chicken Rice as their favourite food?

*Diberi 57 orang murid memilih Ayam Goreng sebagai makanan kegemaran. Yang manakah antara palang A, B, C atau D mewakili bilangan pelajar yang memilih Nasi Ayam sebagai makanan kegemaran?*



- 27 Table 1 shows the number of children for 30 families in Taman Z.  
*Jadual 1 menunjukkan bilangan anak bagi 30 keluarga dalam Taman Z.*

Number of Children <i>Bilangan anak</i>	0	1	2	3	4	5	6
Frequency <i>Frekuensi</i>	3	2	4	3	5	7	6

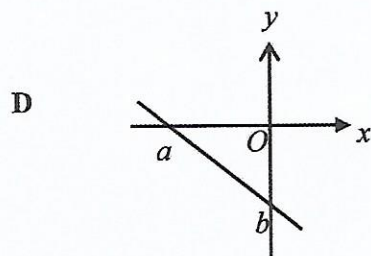
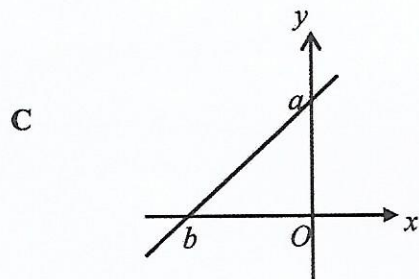
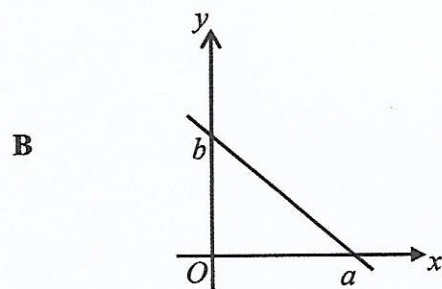
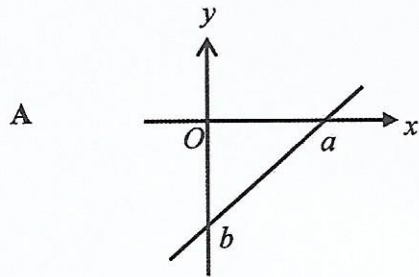
Table 1  
*Jadual 1*

Find the median of the data.  
*Cari median bagi data tersebut.*

- A 3
- B 4
- C 5
- D 7

28 Which graph represents  $\frac{x}{a} - \frac{y}{b} = 1$ ?

Graf manakah yang mewakili  $\frac{x}{a} - \frac{y}{b} = 1$ ?





29 It is given that:

the universal set,  $\xi = \{x : 10 \leq x \leq 25, x \text{ is an integer}\}$ ,

set  $G = \{10, 15, 20, 25\}$ , set  $K = \{11, 13, 17, 19, 23\}$  and

set  $L = \{11, 13, 15, 17, 19, 21, 23, 25\}$ .

List all the elements of set  $(G \cup K)' \cap L$ .

*Diberi bahawa:*

*set semesta, set,  $\xi = \{x : 10 \leq x \leq 25, x \text{ ialah integer}\}$ ,*

*set  $G = \{10, 15, 20, 25\}$ , set  $K = \{11, 13, 17, 19, 23\}$  dan*

*set  $L = \{11, 13, 15, 17, 19, 21, 23, 25\}$ .*

*Senaraikan semua unsur set  $(G \cup K)' \cap L$ .*

A { }

B { 21 }

C { 11, 13, 15, 17, 19, 23, 25 }

D { 11, 13, 15, 17, 19, 21, 23, 25 }

30 Diagram 14 is a Venn diagram showing the universal set,  $\xi$ , set  $K$ , set  $L$  and set  $M$ .

Rajah 14 ialah gambar rajah Venn yang menunjukkan set semesta,  $\xi$ , set  $K$ , set  $L$  dan set  $M$ .

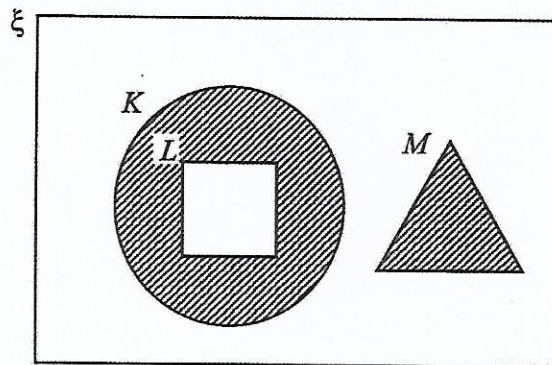


Diagram 14  
Rajah 14

The shaded region represents set  
*Kawasan berlerek mewakili set*

- A  $L' \cap K \cap M$
- B  $L' \cup K \cup M$
- C  $L' \cap K \cup M$
- D  $L' \cup K \cap M$

- 31 Diagram 15 is a Venn diagram showing the type of gadget own by a group of teenagers.

Rajah 15 ialah gambar rajah Venn yang menunjukkan jenis gajet yang dimiliki oleh sekumpulan remaja.

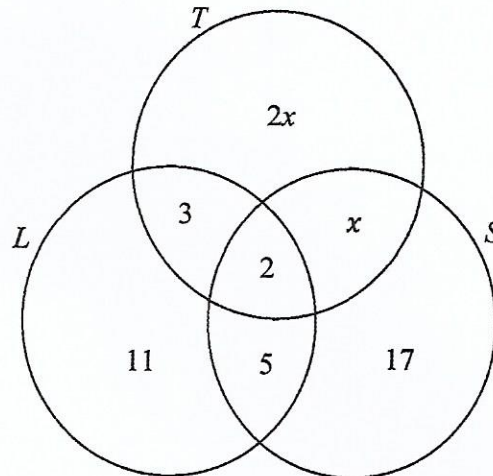


Diagram 15  
Rajah 15

It is given that the universal set  $\xi = T \cup L \cup S$ ,  
 set  $T = \{\text{teenagers who own tablet}\}$ ,  
 set  $L = \{\text{teenagers who own laptop}\}$ ,  
 set  $S = \{\text{teenagers who own smart phone}\}$   
 and  $n(T) = n(T \cup L)$ .

Find the number of teenagers who own two types of gadget.

Diberi bahawa  $\xi = T \cup L \cup S$ ,  
 set  $T = \{\text{remaja yang memiliki tablet}\}$ ,  
 set  $L = \{\text{remaja yang memiliki komputer riba}\}$ ,  
 set  $S = \{\text{remaja yang memiliki telefon pintar}\}$   
 dan  $n(T) = n(T \cup L)$ .

Cari bilangan remaja yang memiliki dua jenis gajet sahaja.

- A 4  
 B 9  
 C 12  
 D 14

- 32 Diagram 16 shows  $PQR$  is an isosceles triangle with  $PR = PQ$  and  $RQ$  is parallel to the  $x$ -axis.

*Rajah 16 menunjukkan  $PQR$  ialah sebuah segi tiga sama kaki dengan  $PR = PQ$  dan  $RQ$  selari dengan paksi- $x$ .*

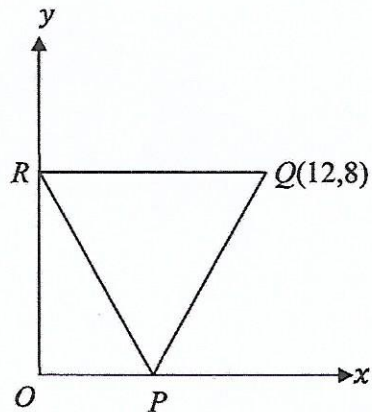


Diagram 16  
*Rajah 16*

Find the gradient of  $PR$ .  
*Cari kecerunan bagi  $PR$ .*

- A  $\frac{4}{3}$   
B  $-\frac{4}{3}$   
C  $\frac{3}{4}$   
D  $-\frac{3}{4}$

- 33 Given that the straight line  $y = (k+2)x + 10$  is parallel to the straight line  $4x + 2y = 5$ . Find the value of  $k$ .

*Diberi garis lurus  $y = (k+2)x + 10$  selari dengan garis lurus  $4x + 2y = 5$ . Cari nilai  $k$ .*

- A -6
- B -4
- C 0
- D 2

- 34 A box contains 6 even numbered cards and  $q$  odd numbered cards. If a card is drawn at random from the box, the probability of getting an odd number card is  $\frac{5}{8}$ . Find the value of  $q$ .

*Sebuah kotak mengandungi 6 kad bernombor genap dan  $q$  kad bernombor ganjil. Jika sekeping kad dipilih secara rawak daripada kotak tersebut, kebarangkalian mendapat kad bernombor ganjil ialah  $\frac{5}{8}$ . Cari nilai  $q$ .*

- A 10
- B 5
- C 3
- D 2

- 35 There are 60 people who have taken part in a competition. If a person is chosen at random from all the participants, the probability of getting a male participants is  $\frac{8}{15}$ . If there are 12 males and 3 females who did not qualify for the competition and have been removed from the group, find the probability that a male participant will be chosen.

*Seramai 60 orang telah mengambil bahagian di dalam suatu pertandingan. Kebarangkalian untuk memilih seorang peserta lelaki daripada kumpulan itu ialah  $\frac{8}{15}$ . Jika terdapat 12 lelaki dan 3 perempuan yang tidak layak untuk menyertai pertandingan dan telah disingkir daripada kumpulan tersebut, cari kebarangkalian bahawa seorang peserta lelaki akan dipilih.*

A  $\frac{1}{3}$

B  $\frac{5}{12}$

C  $\frac{4}{9}$

D  $\frac{7}{15}$

- 36 Given  $V$  varies directly as  $t$ , and inversely as the square of  $r$ . If  $V = kt^p r^q$  where  $k$  is a constant, find the value of  $p$  and of  $q$ .

*Diberi  $V$  berubah secara langsung dengan  $t$ , dan berubah secara songsang dengan kuasa dua  $r$ . Jika  $V = kt^p r^q$  dengan  $k$  ialah pemalar, cari nilai  $p$  dan nilai  $q$ .*

A  $p=1, q=2$

B  $p=-1, q=2$

C  $p=1, q=-2$

D  $p=-1, q=-2$

37 Table 2 shows the changes in  $x$ ,  $y$  and  $z$ .

*Jadual 2 menunjukkan perubahan nilai-nilai  $x$ ,  $y$  dan  $z$ .*

$x$	$d$	$\frac{1}{2}$
$y$	$e$	$m$
$z$	2	7

Table 2  
*Jadual 2*

Given  $x$  varies inversely as  $y$  and  $z$ . Find the value of  $m$  when  $de = 7$ .

*Diberi  $x$  berubah secara songsang dengan  $y$  dan  $z$ . Cari nilai  $m$  apabila  $de = 7$ .*

- A 1
- B 4
- C 14
- D 49

- 38 Diagram 18 shows a few patterns drawn in square grids. The length of sides of each patterns is  $h$  and the number of dots in each pattern is  $d$ .

*Rajah 18 menunjukkan beberapa corak yang dilukis pada grid sisiempat sama. Panjang sisi setiap corak diwakili dengan  $h$  dan bilangan titik pada setiap corak diwakili dengan  $d$ .*

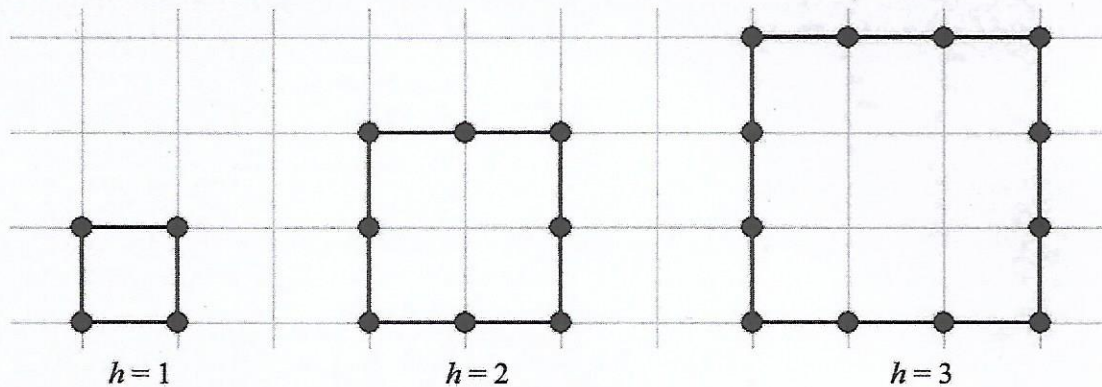


Diagram 18  
Rajah 18

Based on the diagram, which of the following statements is true?

*Berdasarkan rajah, pernyataan manakah yang benar?*

- A  $h$  varies directly of  $d$  and  $h = 20$  when  $d = 5$ .  
 *$h$  berkadar terus terhadap  $d$  dan  $h = 20$  apabila  $d = 5$ .*
- B  $h$  varies inversely of  $d$  and  $h = 20$  when  $d = 5$ .  
 *$h$  berkadar songsang terhadap  $d$  dan  $h = 20$  apabila  $d = 5$ .*
- C  $h$  varies directly of  $d$  and  $h = 5$  when  $d = 20$ .  
 *$h$  berkadar terus terhadap  $d$  dan  $h = 5$  apabila  $d = 20$ .*
- D  $h$  is varies inversely of  $d$  and  $h = 5$  when  $d = 20$ .  
 *$h$  berkadar songsang terhadap  $d$  dan  $h = 5$  apabila  $d = 20$ .*



39 Which of the following statement is true?

*Antara berikut, pernyataan yang manakah benar?*

A For the matrix  $\begin{pmatrix} -1 & 2 & 3 \\ 4 & 0 & 7 \end{pmatrix}$ , the element in the first row and second column is 4.

*Bagi matriks  $\begin{pmatrix} -1 & 2 & 3 \\ 4 & 0 & 7 \end{pmatrix}$ , unsur dalam baris pertama dan lajur kedua ialah 4.*

B  $\begin{pmatrix} 1 \\ -2 \\ 4 \end{pmatrix}$  is called a row matrix.

$\begin{pmatrix} 1 \\ -2 \\ 4 \end{pmatrix}$  dikenali sebagai matriks baris.

C The order of the matrix  $\begin{pmatrix} -3 & 2 \end{pmatrix}$  is  $2 \times 1$ .

*Peringkat matriks bagi  $\begin{pmatrix} -3 & 2 \end{pmatrix}$  ialah  $2 \times 1$ .*

D Matrix  $\begin{pmatrix} 2 & 4 \\ 3 & 6 \end{pmatrix}$  has no inverse matrix.

*Matriks  $\begin{pmatrix} 2 & 4 \\ 3 & 6 \end{pmatrix}$  tiada matriks songsang.*

40 Given that  $[3 \ 4(r+2)] \begin{pmatrix} 1 & -4 \\ 2 & 5 \end{pmatrix} = (11 \ 8)$ , find the value of  $r$ .

*Diberi bahawa  $[3 \ 4(r+2)] \begin{pmatrix} 1 & -4 \\ 2 & 5 \end{pmatrix} = (11 \ 8)$ , cari nilai  $r$ .*

A  $-\frac{5}{2}$

B  $-\frac{11}{8}$

C  $-1$

D  $0$

**END OF QUESTION PAPER**  
***KERTAS SOALAN TAMAT***