

**SULIT**

**1449/1**

**1449/1**

**MATEMATIK**

**Kertas 1**

**Ogos**

**2011**

$1\frac{1}{4}$  jam



**BAHAGIAN PENGURUSAN  
SEKOLAH BERASRAMA PENUH DAN SEKOLAH KECEMERLANGAN  
KEMENTERIAN PELAJARAN MALAYSIA**

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**PEPERIKSAAN PERCUBAAN  
SIJIL PELAJARAN MALAYSIA  
TINGKATAN 5 2011**

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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 Bahasa Melayu.*
3. *Calon dikehendaki membaca maklumat di halaman 2.*

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Kertas soalan ini mengandungi 30 halaman 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**

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

**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 =  $\pi d = 2\pi r$*
- 3 Area of circle =  $\pi r^2$   
*Luas bulatan =  $\pi r^2$*
- 4 Curved surface area of cylinder =  $2\pi r h$   
*Luas permukaan melengkung silinder =  $2\pi r h$*
- 5 Surface area of sphere =  $4\pi r^2$   
*Luas permukaan sfera =  $4\pi r^2$*
- 6 Volume of right prism = cross sectional area  $\times$  length  
*Isipadu prisma tegak = luas keratan rentas  $\times$  panjang*
- 7 Volume of cylinder =  $\pi r^2 h$   
*Isipadu silinder =  $\pi r^2 h$*
- 8 Volume of cone =  $\frac{1}{3} \pi r^2 h$   
*Isipadu kon =  $\frac{1}{3} \pi r^2 h$*
- 9 Volume of sphere =  $\frac{4}{3} \pi r^3$   
*Isipadu sfera =  $\frac{4}{3} \pi r^3$*
- 10 Volume of right pyramid =  $\frac{1}{3} \times \text{base area} \times \text{height}$   
*Isipadu piramid tegak =  $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$*

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- 11 Sum of interior angles of a polygon =  $(n - 2) \times 180^\circ$   
*Hasil tambah sudut pedalaman poligon =  $(n - 2) \times 180^\circ$*
- 12 
$$\frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$
 *$\frac{\text{panjang lengkok}}{\text{lilitan bulatan}} = \frac{\text{sudut di pusat}}{360^\circ}$*
- 13 
$$\frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$
 *$\frac{\text{luas sektor}}{\text{luas bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$*
- 14 Scale factor ,  $k = \frac{PA'}{PA}$   
*Faktor skala ,  $k = \frac{PA'}{PA}$*
- 15 Area of image =  $k^2 \times$  area of object  
*Luas imej =  $k^2 \times$  luas objek*

- 1 Round off 6 346.2 correct to three significant figures.

*Bundarkan 6 346.2 betul kepada tiga angka bererti.*

- A 6 350.0
- B 6 350
- C 6340
- D 635

- 2  $3.14 \times 10^{-5} - 1.3 \times 10^{-6} =$

- A  $1.84 \times 10^{-5}$
- B  $1.84 \times 10^{-6}$
- C  $3.01 \times 10^{-5}$
- D  $3.01 \times 10^{-6}$

- 3  $\frac{4.88 \times 10^9}{0.0004} =$

- A  $1.22 \times 10^{13}$
- B  $1.22 \times 10^{-13}$
- C  $1.22 \times 10^5$
- D  $1.22 \times 10^{-5}$

- 4 A container consist of 50 boxes of goods. If each box can hold  $3.7 \times 10^5$  kg of goods, find the total weight of the container.

*Sebuah kontena mengandungi 50 kotak barang. Jika berat sebuah kotak ialah  $3.7 \times 10^5$  kg, cari jumlah berat kontena tersebut.*

- A  $1.85 \times 10^5$
- B  $1.85 \times 10^7$
- C  $1.85 \times 10^8$
- D  $1.85 \times 10^{20}$

5 Express  $334_5$  as a number in base ten.

Ungkapkan  $334_5$  sebagai nombor dalam asas sepuluh.

- A 90
- B 94
- C 450
- D 470

6  $110011_2 + 1111_2$

- A  $100000_2$
- B  $100010_2$
- C  $1000000_2$
- D  $1000010_2$

7 Diagram 7 shows a hexagon  $PQRSTU$ .

Rajah 7 menunjukkan heksagon  $PQRSTU$ .

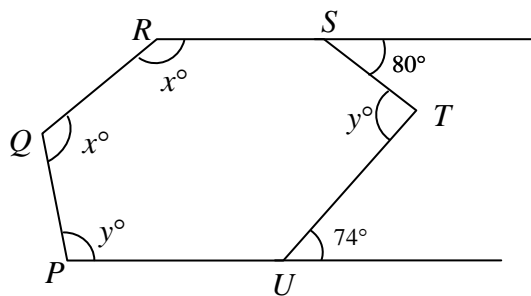


Diagram 7  
Rajah 7

Find the value of  $x + y$

Cari nilai  $x + y$

- A  $132^\circ$
- B  $257^\circ$
- C  $334^\circ$
- D  $514^\circ$

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8 In Diagram 8,  $JKL$  is an isosceles triangle.

*Dalam Rajah 8,  $JKL$  ialah segi tiga sama kaki.*

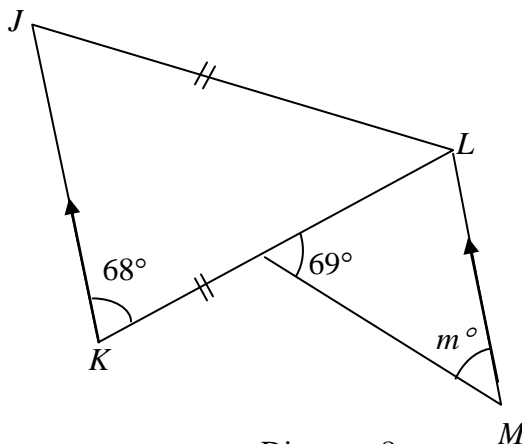


Diagram 8  
Rajah 8

The value of  $m$  is

*Nilai  $m$  ialah*

- A  $41^\circ$
- B  $43^\circ$
- C  $53^\circ$
- D  $55^\circ$

- 9 Diagram 9 shows a circle,  $QST$ , centre  $O$ .  $PQR$  is a tangent to the circle at  $Q$ .  
*Rajah 9 menunjukkan sebuah bulatan,  $QST$ , berpusat  $O$ .  $PQR$  adalah tangen kepada bulatan tersebut di titik  $Q$ .*

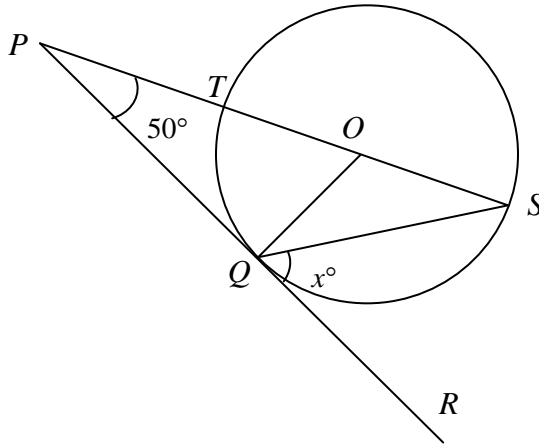


Diagram 9  
*Rajah 9*

The value of  $x$  is

*Nilai  $x$  ialah*

- A  $20^\circ$
- B  $40^\circ$
- C  $50^\circ$
- D  $70^\circ$



10 Diagram 10 shows two triangles,  $P$  and  $Q$ , drawn on square grids.

*Rajah 10 menunjukkan dua buah segi tiga  $P$  dan  $Q$ , dilukis pada grid segi empat sama.*

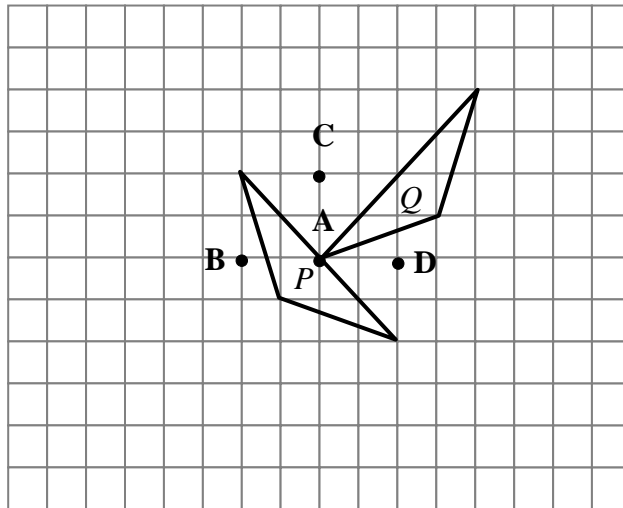


Diagram 10

*Rajah 10*

$Q$  is the image of  $P$  under an anticlockwise rotation of  $90^\circ$ .

Which of the points, **A**, **B**, **C** or **D**, is the centre of the rotation?

*$Q$  ialah imej bagi  $P$  di bawah satu putaran  $90^\circ$  lawan arah jam.*

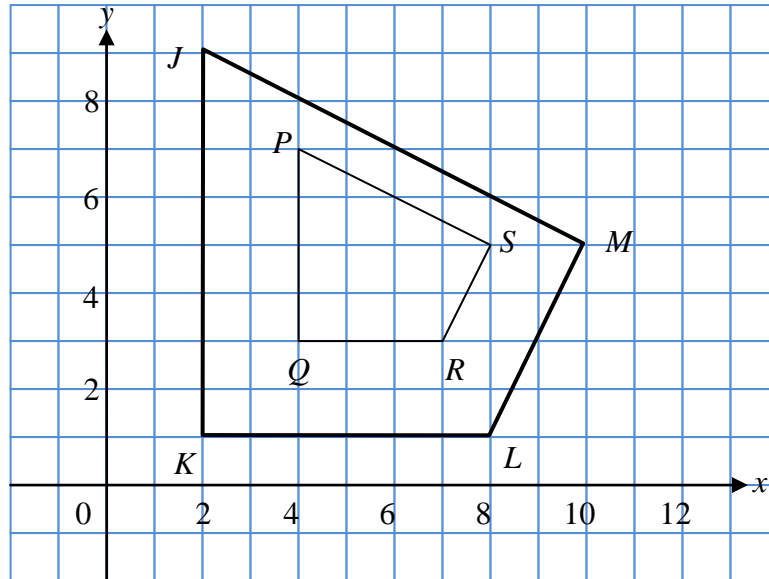
*Antara titik-titik **A**, **B**, **C** dan **D**, yang manakah pusat putaran itu?*

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- 11 In Diagram 11, quadrilateral  $PQRS$  is the image of quadrilateral  $JKLM$  under an enlargement.

*Dalam Rajah 11, sisi empat  $PQRS$  ialah imej bagi sisi empat  $JKLM$  di bawah satu pembesaran tertentu.*



The centre of the enlargement is

*Pusat pembesaran ialah*

- A (7, 5)
- B (6, 4)
- C (6, 5)
- D (7, 4)

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**12** In Diagram 12,  $EFG$  is a straight line.

*Dalam Rajah 12,  $EFG$  ialah satu garis lurus.*

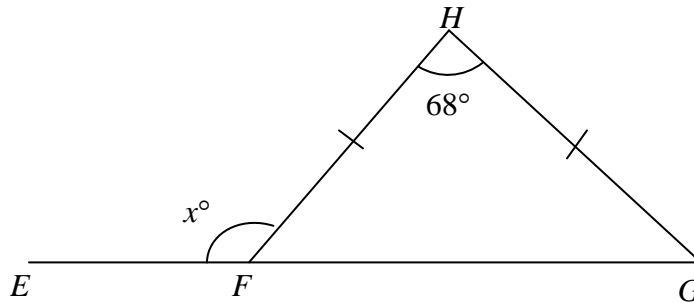


Diagram 12

*Rajah 12*

Given that  $\angle FHG = 68^\circ$ , find the value of  $\tan x^\circ$ .

*Diberi  $\angle FHG = 68^\circ$ , cari nilai bagi  $\tan x^\circ$ .*

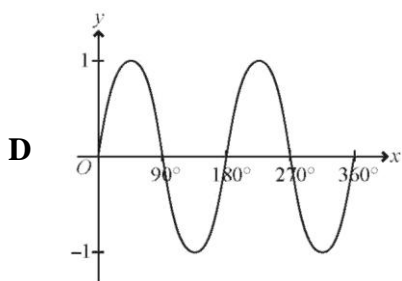
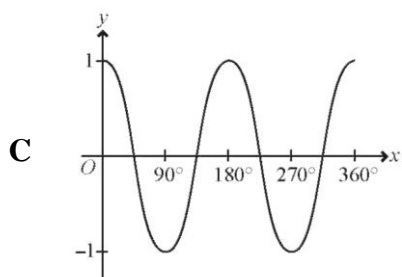
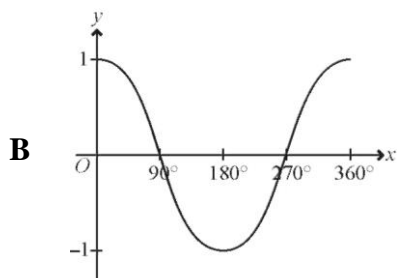
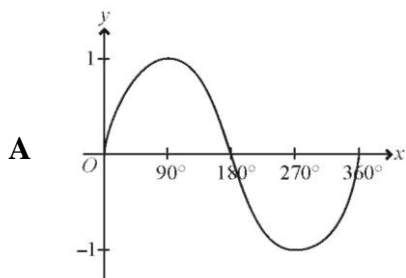
- A -2.475
- B -1.483
- C 1.483
- D 2.475

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**13** Which of the following graphs represents  $y = \cos 2x^\circ$  for  $0^\circ \leq x \leq 360^\circ$ ?

*Antara graf yang berikut, manakah mewakili  $y = \cos 2x^\circ$  untuk  $0 \leq x \leq 360^\circ$ ?*



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**14** Diagram 14 shows a cuboid with a horizontal base  $JKLM$ .

*Rajah 14 menunjukkan sebuah kuboid dengan tapak mengufuk  $JKLM$ .*

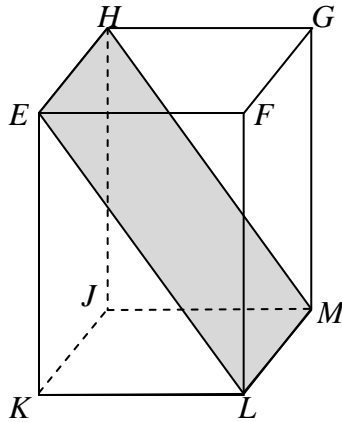


Diagram 14  
*Rajah 14*

Name the angle between the planes  $ELMH$  and  $EHJK$ .

*Namakan sudut di antara satah  $ELMH$  dengan satah  $EHJK$*

- A  $\angle JHM$
- B  $\angle FEL$
- C  $\angle HLJ$
- D  $\angle ELK$

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**15** In Diagram 15,  $EF$  is a vertical pillar on a horizontal plane.

*Dalam Rajah 15,  $EF$  ialah satu tiang tegak pada satu satah mengufuk.*

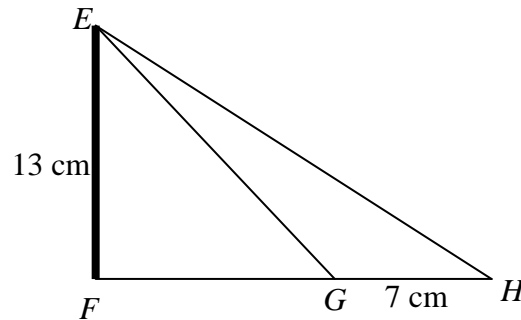


Diagram 15  
Rajah 15

The angle of elevation  $E$  from  $H$  is  $40^\circ$ .  
Calculate the angle of depression of  $G$  from  $E$ .

*Sudut dongakan  $E$  dari  $H$  ialah  $40^\circ$ .  
Hitungkan sudut tunduk  $G$  dari  $E$ .*

- A  $16^\circ 44'$
- B  $33^\circ 9'$
- C  $56^\circ 51'$
- D  $73^\circ 16'$

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- 16** In Diagram 16,  $JL$  and  $NM$  are two vertical poles on a horizontal plane.  $K$  is a point on  $JL$  such that  $KL = NM$ .

*Dalam Rajah 16,  $JL$  dan  $NM$  ialah tiang tegak pada satu satah mangufuk.  $K$  ialah satu titik pada  $JL$  dengan keadaan  $KL = NM$ .*

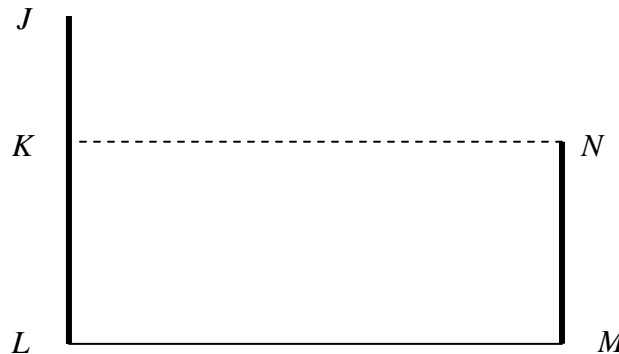


Diagram 16  
Rajah 16

The angle of depression of  $N$  from  $J$  is

*Sudut tunduk  $N$  dari  $J$  ialah*

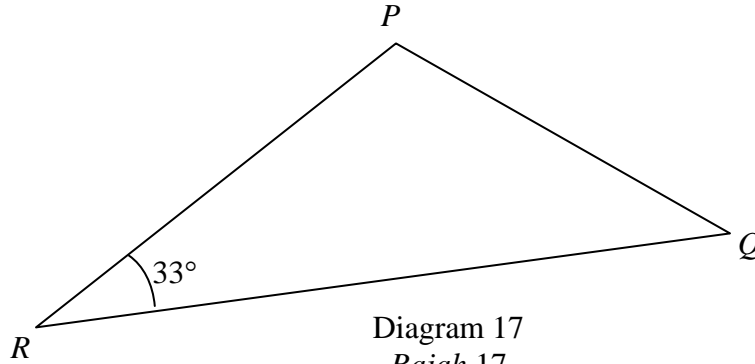
- A**  $\angle JNK$
- B**  $\angle JMK$
- C**  $\angle NJK$
- D**  $\angle MJK$

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**17** Diagram 17 shows three points,  $P$ ,  $Q$  and  $R$ , on horizontal plane.  $Q$  is due east of  $P$ .

*Rajah 17 menunjukkan tiga titik  $P$ ,  $Q$  dan  $R$ , yang terlentang pada suatu satah mengufuk.  $Q$  berada di timur  $P$ .*



Given bearing  $R$  from  $Q$  is  $230^\circ$ .  
Find the bearing  $R$  from  $P$ .

*Diberi bearing  $R$  dari  $Q$  ialah  $230^\circ$ .  
Cari bearing  $R$  dari  $P$ .*

- A**  $017^\circ$
- B**  $107^\circ$
- C**  $197^\circ$
- D**  $214^\circ$



- 18 In Diagram 18,  $NGS$  is the Greenwich Meridian and  $PQ$  is the diameter of a parallel latitude.

*Dalam Rajah 18,  $NGS$  ialah Meridian Greenwich dan  $PQ$  ialah diameter selarian latitude.*

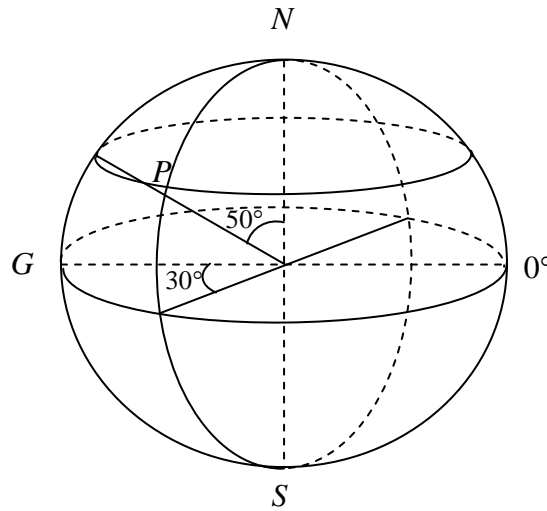


Diagram 18

Rajah 18

Find the position of point  $Q$ .

*Cari kedudukan titik  $Q$ .*

- A (50°N, 150° W)  
(50°U, 150° B)
- B (40°N, 150° E)  
(40°U, 150° T)
- C (50°N, 150° E)  
(50°U, 150° T)
- D (40°N, 150° W)  
(40°U, 150° B)

- 19  $3p^2 - 19p + 6 =$
- A  $(3p - 1)(p - 6)$
- B  $(3p - 6)(p + 1)$
- C  $(3p - 6)(p - 1)$
- D  $(3p + 1)(p - 6)$

- 20 Express  $\frac{2}{a-1} - \frac{2}{3a}$  as a single fraction in its simplest form.

Ungkapkan  $\frac{2}{a-1} - \frac{2}{3a}$  sebagai satu pecahan tunggal dalam bentuk termudah.

- A  $\frac{4a+1}{3a(a-1)}$
- B  $\frac{4a-1}{3a(a-1)}$
- C  $\frac{2(2a+1)}{3a(a-1)}$
- D  $\frac{2}{3a}$
- 21 Given that  $k = \frac{2l}{3l+1}$ , express  $l$  in terms of  $k$ .

Diberi bahawa  $k = \frac{2l}{3l+1}$ , ungkapkan  $l$  dalam sebutan  $k$ .

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

22  $(2k - 3)^2 + 4k(k - 4) =$

A  $8k^2 - 28k + 9$

B  $8k^2 - 20k + 9$

C  $8k^2 - 16k - 7$

D  $8k^2 - 12k - 7$

23 Simplify  $\frac{(g^3h^5)^2}{h^{10}}$

Ringkaskan  $\frac{(g^3h^5)^2}{h^{10}}$

A  $g^5h^{10}$

B  $g^5h^{-3}$

C  $g^6h$

D  $g^6$

24 Evaluate  $(3^4 \times 5^{10})^{\frac{1}{5}} \div (9^2 \times 125^{-4})$

Nilaikan  $(3^4 \times 5^{10})^{\frac{1}{5}} \div (9^2 \times 125^{-4})$ .

A  $(\sqrt[5]{3})^{16} \times 5^{14}$

B  $\frac{1}{(\sqrt[5]{3})^{16}} \times 5^{14}$

C  $\frac{1}{(\sqrt[16]{3})^5} \times 5^{14}$

D  $(\sqrt[16]{3})^5 \times 5^{14}$

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25 The solution for  $x \leq 2x - \frac{1}{4}$  is

*Penyelesaian bagi  $x \leq 2x - \frac{1}{4}$  ialah*

A  $x \geq \frac{1}{4}$

B  $x \leq \frac{1}{4}$

C  $x \leq \frac{1}{2}$

D  $x \geq \frac{1}{2}$

26 List all the integers values of  $x$  that satisfy both simultaneous linear inequalities  
 $4x - 5 < 7$  and  $5 - x \leq 6$

*Senaraikan semua nilai integer bagi  $x$  yang memenuhi kedua-dua ketaksamaan linear  
 $4x - 5 < 7$  dan  $5 - x \leq 6$*

A  $-1, 0, 1, 2, 3$

B  $-1, 0, 1, 2,$

C  $0, 1, 2, 3$

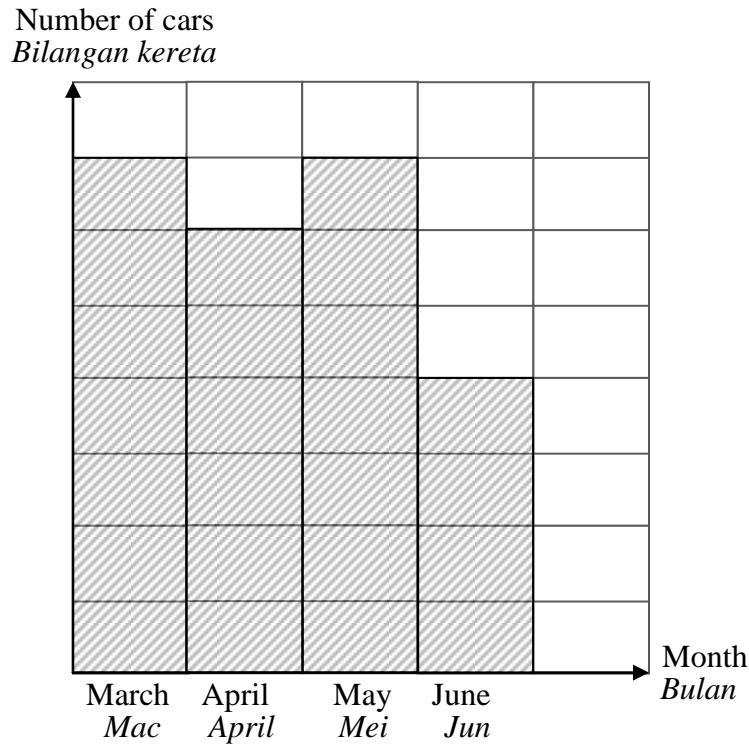
D  $-1, 1, 2$

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- 27 Diagram 27 is a histogram chart which shows the sales of cars for March, April, May and June.

*Rajah 27 ialah histogram yang menunjukkan jualan kereta bagi bulan Mac, April, Mei dan Jun.*



The sales during the four months , from March to June is 600 cars.  
How many cars being sold in April?

*Jualan sepanjang empat bulan itu, dari bulan Mac hingga bulan Jun ialah 600 kereta.  
Berapakah bilangan kereta dijual pada bulan April*

- A 60
- B 70
- C 100
- D 150

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**28** The pie chart in Diagram 28 shows the favourite drink flavours of 720 pupil.

*Carta pai dalam Rajah 28 menunjukkan perisa minuman yang digemari oleh 720 murid.*

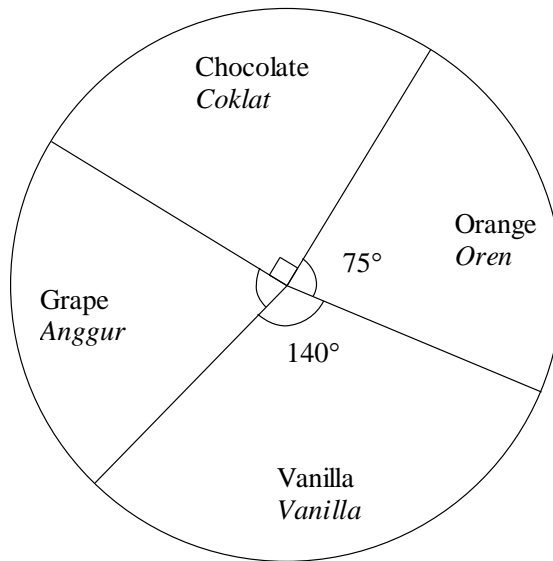


Diagram 28  
Rajah 28

Calculate the difference between the number of children who like chocolate flavour drink and that of grape.

*Hitungkan beza antara bilangan kanak-kanak yang suka minuman perisa coklat dan bilangan kanak-kanak yang suka perisa anggur.*

- A 55
- B 70
- C 110
- D 190

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**29** Table 29 shows the score of a group of students in a mathematics quiz.

*Jadual 2 menunjukkan skor bagi sekumpulan pelajar dalam satu kuiz matematik.*

Score <i>Skor</i>	0	1	2	3	4
Frequency <i>Kekerapan</i>	9	10	7	6	8

Table 29  
*Jadual 29*

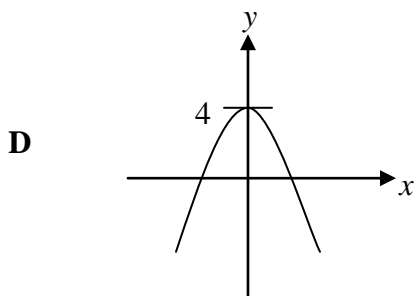
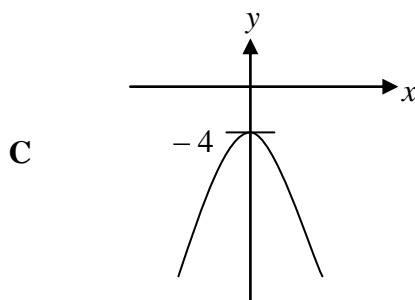
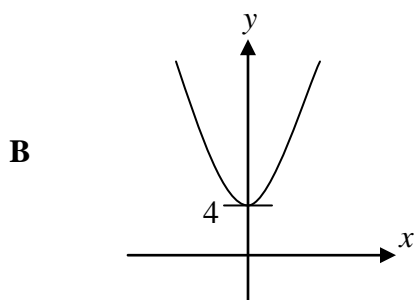
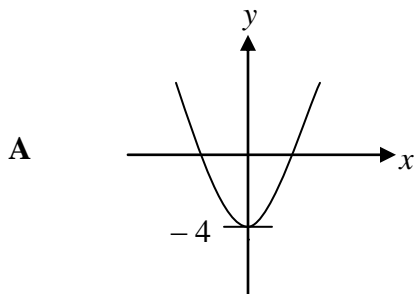
Find the median score.

*Cari median skor itu.*

- A** 0
- B** 1
- C** 1.5
- D** 2

30 Which of the following graphs represents  $y = 4 - x^2$

*Antara berikut, graf manakah yang menunjukkan  $y = 4 - x^2$*





- 31 Diagram 31 is a Venn diagram showing set  $P$  and set  $Q$ .

*Rajah 31 ialah gambarajah Venn menunjukkan set  $P$  dan set  $Q$ .*

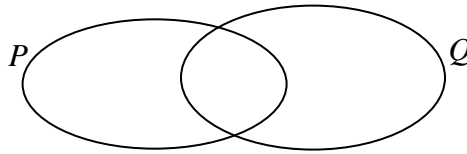


Diagram 31

*Rajah 31*

It is given that the universal set,  $\xi = P \cup Q$ ,  $n(P) = 15$ ,  $n(Q) = 12$  and  $n(P \cup Q) = 22$ .

Find the value of  $n(P \cap Q)$

*Diberi bahawa set semesta  $\xi = P \cup Q$ ,  $n(P) = 15$ ,  $n(Q) = 12$  dan  $n(P \cup Q) = 22$ .*

*Cari nilai  $n(P \cap Q)$*

- A 10
  - B 7
  - C 5
  - D 3
- 32 If the number of subset  $P$  is 32, find  $n(P)$ .
- Jika bilangan subset  $P$  ialah 32, cari  $n(P)$ .*
- A 4
  - B 5
  - C 8
  - D 16
- 33 Determine the  $x$ -intercept of the straight line  $3x + 2y + 12 = 0$
- Tentukan pintasan- $x$  bagi garis lurus  $3x + 2y + 12 = 0$*
- A - 6
  - B - 4
  - C 4
  - D 6

- 34 Find the gradient that joint the points  $(-8,0)$  and  $(0,4)$ .

*Cari kecerunan garis yang menghubungkan titik  $(-8,0)$  dan titik  $(0,4)$ .*

A  $-2$

B  $-\frac{1}{2}$

C  $\frac{1}{2}$

D  $2$

- 35 There are 64 students in Account Class. The probability of picking a student who wears spectacles at random is  $\frac{5}{8}$ .

Find the number of students who do not wear spectacles in the class.

*Terdapat 64 pelajar dalam Kelas Akaun. Kebarangkalian memilih seorang pelajar yang memakai cermin mata secara rawak ialah  $\frac{5}{8}$ .*

*Cari bilangan pelajar yang tidak memakai cermin mata dalam kelas itu.*

A 24

B 36

C 40

D 48

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- 36** Given that the probability of team  $P$  to win in a first match and second match are  $\frac{1}{5}$ , and  $\frac{3}{5}$  respectively.

Find the probability of team  $P$  to lose in both matches.

*Diberi kebarangkalian pasukan  $P$  memenangi pertandingan pertama dan kedua masing-masing ialah  $\frac{1}{5}$  dan  $\frac{3}{5}$ .*

*Cari kebarangkalian pasukan  $P$  kalah dalam kedua-dua pertandingan itu.*

- A**  $\frac{22}{25}$
- B**  $\frac{8}{25}$
- C**  $\frac{6}{25}$
- D**  $\frac{3}{25}$

37 Table 37 shows some values of the variables  $P$  and  $Q$ .

*Jadual 37 menunjukkan beberapa nilai bagi pemboleh ubah  $P$  dan  $Q$ .*

$P$	31	279
$Q$	2	$m$

Table 37  
*Jadual 37*

It is given that  $P$  varies inversely as the square of  $Q$ .  
Find the value of  $m$ .

*Diberi bahawa  $P$  berubah secara songsang dengan kuasa dua  $Q$ .  
Cari nilai  $m$ .*

A  $\frac{2}{3}$

B  $\frac{3}{2}$

C  $\frac{9}{4}$

D  $\frac{4}{9}$

- 38  $P$  varies directly to the cube root of  $X$  and inversely as  $Y$ . Given that the constant is  $k$ , find the relation between  $P$ ,  $X$  and  $Y$ .

*$P$  berubah secara langsung dengan punca kuasa tiga  $X$  dan secara songsang dengan  $Y$ . Diberi  $k$  ialah pemalar, cari hubungan antara  $P$ ,  $X$  dan  $Y$ .*

A  $P = \frac{k X^3}{Y}$

B  $P = \frac{kX^{\frac{1}{3}}}{Y}$

C  $P = k X^{\frac{1}{3}} Y$

D  $P = \frac{k Y^3}{X}$

39  $\frac{1}{2} \begin{pmatrix} 4 & 6 \\ -2 & 0 \end{pmatrix} - \begin{pmatrix} 2 & -5 \\ 3 & 7 \end{pmatrix} =$

A  $\begin{pmatrix} 0 & 8 \\ -4 & -7 \end{pmatrix}$

B  $\begin{pmatrix} 2 & 11 \\ -5 & 7 \end{pmatrix}$

C  $\begin{pmatrix} 2 & 11 \\ -4 & -7 \end{pmatrix}$

D  $\begin{pmatrix} 6 & 7 \\ 1 & -7 \end{pmatrix}$

40 Given  $(2k \ 3) \begin{pmatrix} 1 & -2 \\ 4 & k \end{pmatrix} = (10 \ 1)$ . Find the value of  $k$ .

A -1

B 1

C 8

D 11

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