

1449/1
Mathematics
Paper 1
September 2010
1¼ jam



JABATAN PELAJARAN NEGERI JOHOR

PEPERIKSAAN PERCUBAAN SPM 2010

MATHEMATICS

Paper 1

One hour and fifhteen minutes

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas soalan ini adalah dalam dwibahasa.*
2. *Soalan di bahagian atas adalah dalam bahasa Inggeris, diikuti oleh bahasa Melayu.*
3. *Calon dikehendaki membaca maklumat di halaman 2.*

Kertas soalan ini mengandungi 26 halaman bercetak.

Lihat Halaman Sebelah

SULIT

INFORMATION FOR CANDIDATES

MAKLUMAT UNTUK CALON

1. This question paper consists of 40 questions
Kertas soalan ini mengandungi 40 soalan.
2. Answer **all** questions.
*Jawab **semua** soalan.*
3. Answer each question by blackening the correct space on the answer sheet.
Jawab dengan menghitamkan ruangan yang betul pada kertas jawapan.
4. Blacken only **one** space for each question .
Bagi setiap soalan hitamkan satu ruangan sahaja.
5. If you wish to change your answer, erase the blackened mark that you have made.
Sekiranya anda hendak menukarkan jawapan, padamkan tanda yang telah dibuat.
6. Then blacken the space for the new answer.
Kemudian hitamkan jawapan yang baru.
7. The diagrams in the questions provided are not drawn to the scale unless stated.
Rajah yang mengiringi setiap soalan tidak dilukiskan mengikut skala kecuali dinyatakan.
8. A list of formulae is provided .
Satu senarai rumus disediakan.
9. A booklet of four-figure mathematical tables is provided.
Sebuah buku sifir matematik empat angka disediakan.
10. You may use a non-programmable scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.

Lihat Halaman Sebelah

SULIT

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

Lihat Halaman Sebelah

SULIT

**SHAPE 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 = πr^2
Luas bulatan = πj^2
- 4 Curved surface area of cylinder = $2\pi r h$
Luas permukaan melengkung silinder = $2\pi j t$
- 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
Isipadu prisma tegak = *luas keratan rentas* \times *panjang*
- 7 Volume of cylinder = $\pi r^2 h$
Isipadu silinder = $\pi j^2 t$
- 8 Volume of cone = $\frac{1}{3} \pi r^2 h$
Isipadu kon = $\frac{1}{3} \pi j^2 t$
- 9 Volume of sphere = $\frac{4}{3} \pi r^3$
Isipadu sfera = $\frac{4}{3} \pi j^3$
- 10 Volume of right pyramid = $\frac{1}{3} \times \text{base area} \times \text{height}$
Isipadu piramid tegak = $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$
- 11 Sum of interior angles of a polygon = $(n - 2) \times 180^\circ$
Hasil tambah sudut pedalaman poligon = $(n - 2) \times 180^\circ$

Lihat Halaman Sebelah

SULIT

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

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

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

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

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

Faktor skala,

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

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

Lihat Halaman Sebelah
SULIT

- 1 Find the value of $0.4593 + 5.2 \times 0.8$ and round off the answer correct to three significant figures.
Cari nilai $0.4593 + 5.12 \times 0.8$ dan bundarkan jawapan itu betul kepada tiga angka bererti.
- A 4.46
B 4.56
C 4.555
D 4.5553
- 2 Express 0.00008603 in standard form.
Ungkapkan 0.00008603 dalam bentuk piawai.
- A 8.603×10^{-5}
B 8.603×10^{-4}
C 8.603×10^4
D 8.603×10^5
- 3 $7.28 \times 10^{-7} - 5.6 \times 10^{-9} =$
- A 1.68×10^2
B 1.68×10^{-7}
C 7.224×10^2
D 7.224×10^{-7}
- 4 7800 kg of curry powder is packed into small packets. Each packet is filled with 60 g of curry powder. Calculate the number of small packets packed.
7800 kg serbuk kari dibungkus ke dalam bungkusan kecil. Setiap bungkusan mengandungi 60 g serbuk kari. Hitung jumlah bungkusan yang terhasil.
- A 1.30×10^2
B 1.30×10^5
C 4.68×10^5
D 4.68×10^8

Lihat Halaman Sebelah
SULIT

- 5 Express 1234_5 as a number in base eight.

Ungkapkan 1234_5 sebagai nombor dalam asas lapan.

- A 276_8
 B 302_8
 C 1136_8
 D 2322_8

- 6 $101100_2 - 1110_2 =$

- A 10000_2
 B 10100_2
 C 10110_2
 D 11110_2

- 7 In Diagram 7, $PQRSTU$ and $PUFGH$ are regular polygons. GUJ and RSJ are straight lines.

Dalam Rajah 7, $PQRSTU$ dan $PUFGH$ ialah polygon sekata. GUJ dan RSJ ialah garis lurus.

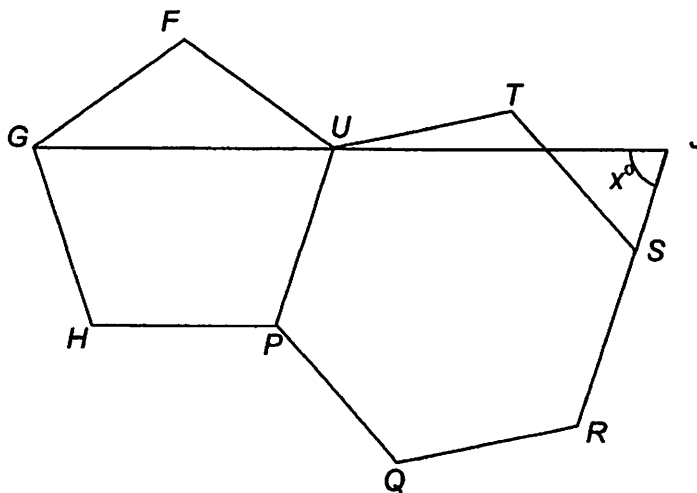


Diagram 7
 Rajah 7

Find the value of x .
Cari nilai x .

- A 60
 B 72
 C 90
 D 120

Lihat Halaman Sebelah
 SULIT

- 8 In Diagram 8, TUV is an isosceles triangle. UVP is a straight line.
 Dalam Rajah 8, TUV ialah sebuah segi tiga sama kaki. UVP ialah garis lurus.

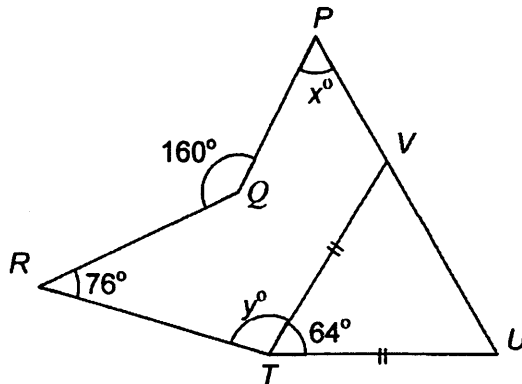


Diagram 8
Rajah 8

Calculate the value of $x + y$.

Hitung nilai $x + y$.

- A 142
 B 174
 C 192
 D 200
- 9 In Diagram 9, PQR is a tangent to circle $QUTW$ at Q .
 STR is a tangent to the circle $QUTW$ at point T .
 Dalam Rajah 9, PQR ialah tangent kepada bulatan $QUTW$ di titik Q .
 STR ialah tangent kepada bulatan di titik T .

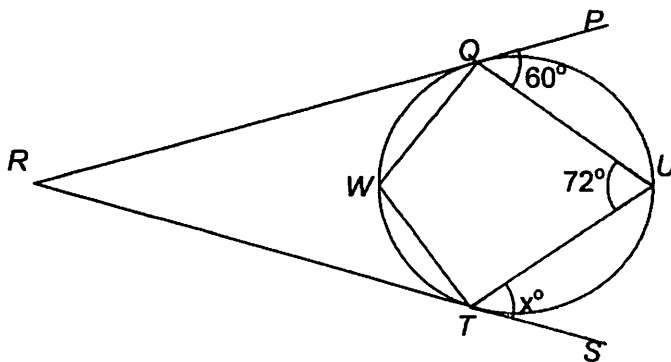


Diagram 9
Rajah 9

Find the value of x .
 Cari nilai x .

- A 30
 B 36
 C 48
 D 60

Lihat Halaman Sebelah
 SULIT

- A (0, 6)
- B (5, 1)
- C (6, 4)
- D (7, 7)

The coordinates of centre P is
Koordinat bagi pusat P ialah

Point M' is the image of point M under a clockwise rotation of 90° about centre P.
Titik M' ialah imej bagi titik M bawah satu putaran mengikut arah jam pada pusat P.

Diagram 10
Rajah 10

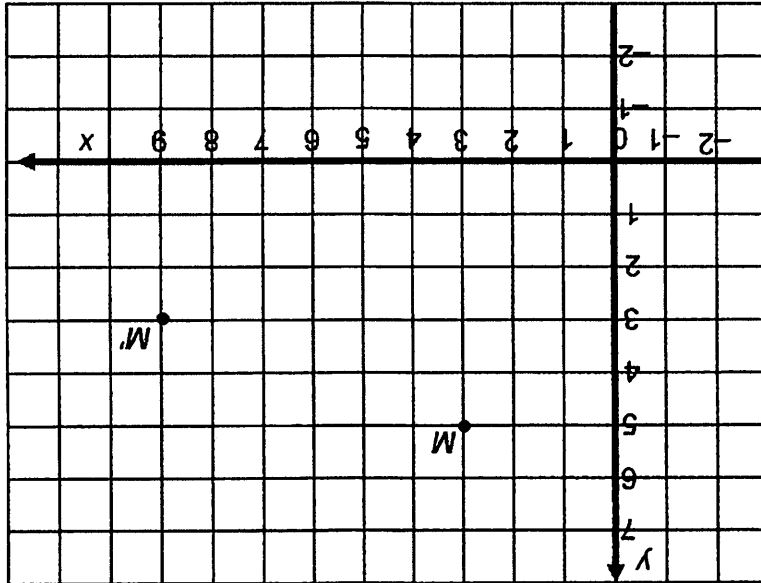


Diagram 10 shows point M and point M' on a Cartesian plane.
Rajah 10 menunjukkan titik M dan titik M' di atas satah Cartesian.

10

- 11 Diagram 11 shows parallelogram $PQRS$ and $VWXY$ drawn on a Cartesian plane. $VWXY$ is the image of $PQRS$ under an enlargement.

Rajah 11 menunjukkan segi empat selari $PQRS$ dan $VWXY$ dilukis di atas satah Cartesian. Segi empat selari $VWXY$ ialah imej bagi segi empat selari $PQRS$ di bawah satu pembesaran.

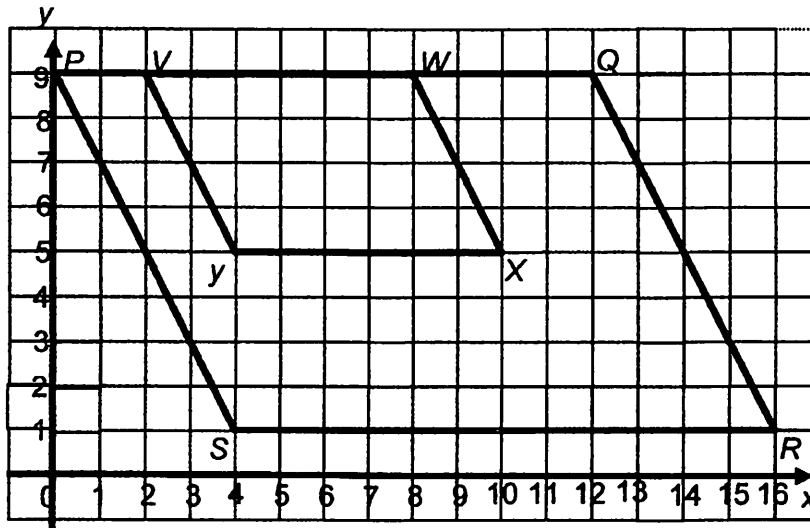


Diagram 11

Rajah 11

The centre and the scale factor of the enlargement are

Pusat dan factor skala pembesaran itu ialah

	Centre of enlargement Pusat pembesaran	Scale factor Faktor skala
A	(5, 9)	2
B	(8, 5)	2
C	(6, 7)	$\frac{1}{2}$
D	(4, 9)	$\frac{1}{2}$

Lihat Halaman Sebelah

SULIT

- 12 In Diagram 12, TPQ is a right-angled triangle.
 $PQRS$ is a straight line. $TQ = 26$ cm and $QR = 8$ cm.

Dalam Rajah 12, TPQ ialah sebuah segitiga bersudut tegak.
 $PQRS$ ialah garis lurus. $TQ = 26$ cm dan $QR = 8$ cm.

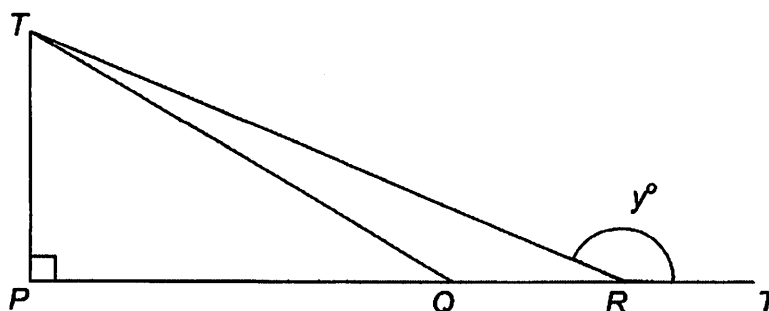


Diagram 12

Rajah 12

Given that $\cos \angle PQT = \frac{12}{13}$, find the value of $\tan y^\circ$.

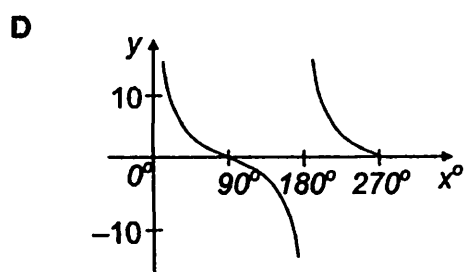
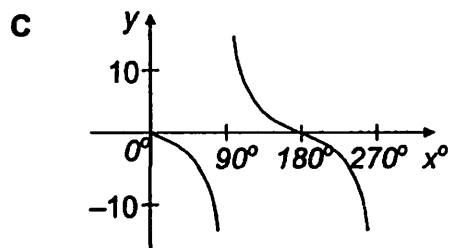
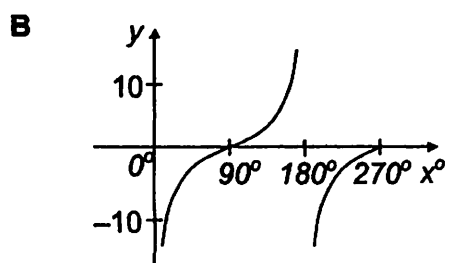
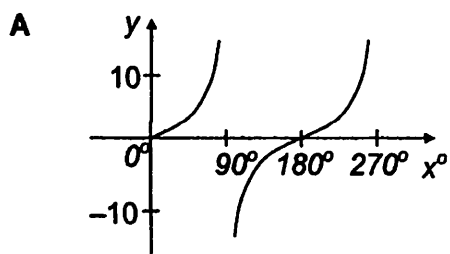
Diberi $\cos \angle PQT = \frac{12}{13}$, cari nilai bagi $\tan y^\circ$.

- A $-\frac{1}{2}$
 B $-\frac{5}{4}$
 C $-\frac{13}{8}$
 D $-\frac{5}{16}$

Lihat Halaman Sebelah
 SULIT

13 Which graph represents $y = \tan x^\circ$ for $0^\circ \leq x \leq 270^\circ$?

Graf manakah yang mewakili $y = \tan x^\circ$ untuk $0^\circ \leq x \leq 270^\circ$?



Lihat Halaman Sebelah
SULIT

- 14 Diagram 14 shows a right prism with a rectangular base $MNPQ$. The right-angled triangle MNS is the uniform cross section of the prism.

Rajah 14 menunjukkan sebuah prisma tegak dengan tapak mengufuk $MNPQ$. Segi tiga tepat MNS ialah keratan rentas seragam bagi prisma tersebut.

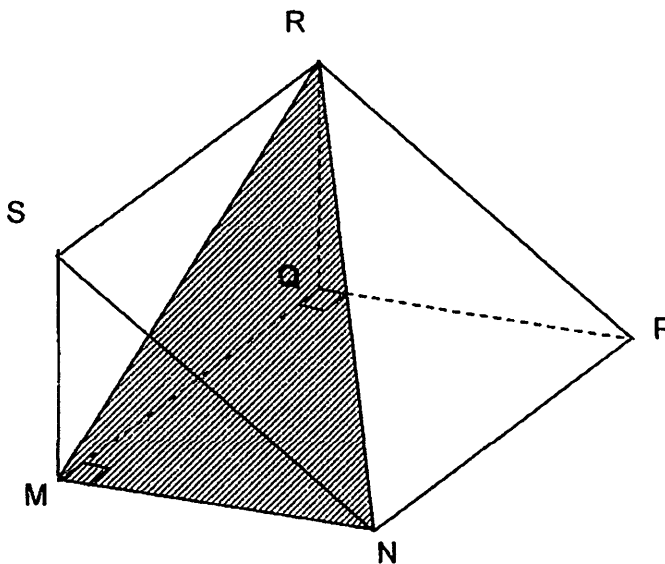


Diagram 14

Rajah 14

Name the angle between the plane MNR and the base $MNPQ$.

Namakan sudut di antara satah MNR dengan tapak $MNPQ$

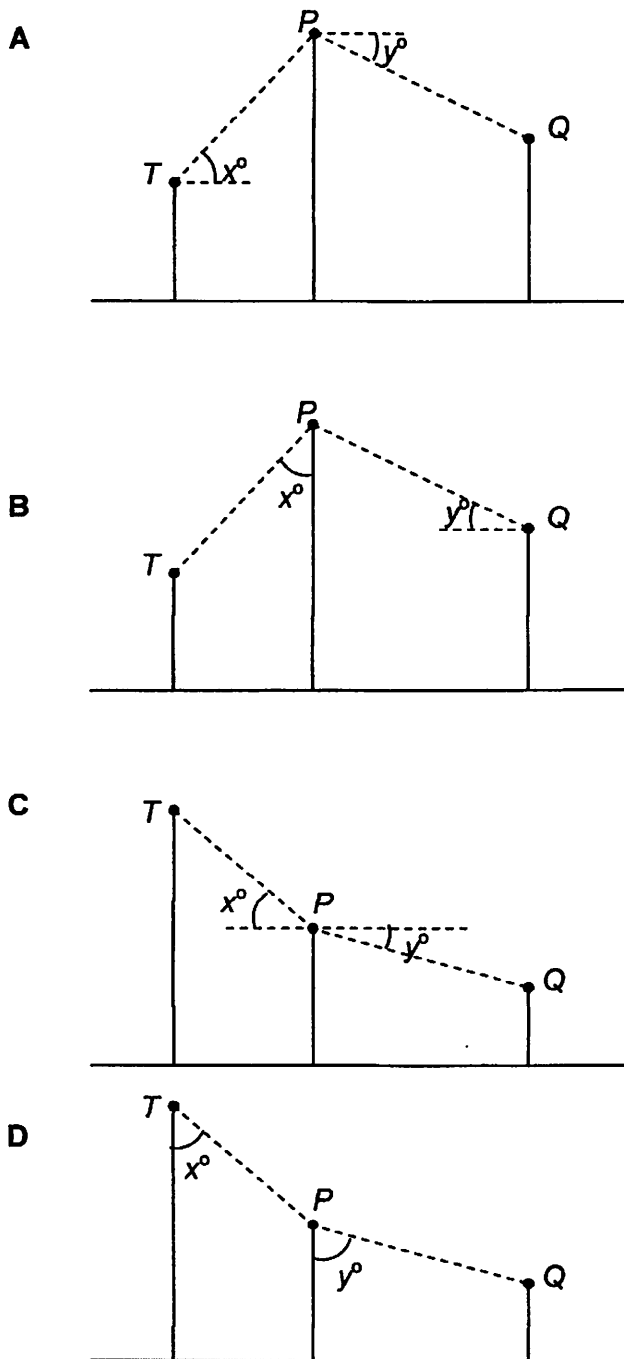
- A $\angle RMQ$
- B $\angle RNQ$
- C $\angle RQM$
- D $\angle RQN$

Lihat Halaman Sebelah

SULIT

- 15 T, P and Q are tips on three vertical poles. Angle of elevation of point P from point T is x° . Angle of depression of point Q from P is y° . Which diagram represents the situation ?

T, P dan Q adalah puncak-puncak bagi tiga batang tiang tegak. Sudut dongakan titik P dari T ialah x° dan sudut tunduk titik Q dari P ialah y° . Rajah manakah yang mewakili situasi tersebut ?



Lihat Halaman Sebelah
SULIT

- 16 In Diagram 16, HJ and KL are two vertical poles on a horizontal plane.
 Dalam Rajah 16, HJ dan KL ialah dua batang tiang tegak pada satah mengufuk.



Diagram 16
Rajah 16

The angle of elevation of H from K is 44°

Calculate the height, in m of the pole KL .

Sudut dongakan H dari K ialah 44°

Hitungkan tinggi, dalam m, tiang KL .

- | | | | |
|---|-------|---|-------|
| A | 5.36 | B | 6.62 |
| C | 11.05 | D | 11.50 |

- 17 Diagram 17 shows three points P , Q , and R on a horizontal plane.
 Rajah 17 menunjukkan tiga titik P , Q , dan R pada satah mengufuk

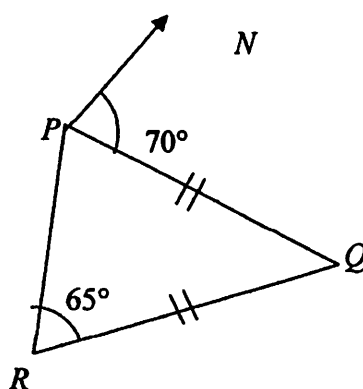


Diagram 17
Rajah 17

Find the bearing of R from Q .

Cari bearing R dari Q .

- | | | | |
|---|-------------|---|-------------|
| A | 020° | B | 065° |
| C | 160° | D | 200° |

Lihat Halaman Sebelah
SULIT

- 18 Diagram 18, shows three points, P , Q and R on the surface of the earth. P and Q lies on the equator. NPS is the Greenwich Meridian and O is the centre of the earth. State the position of point R .

Rajah 18 menunjukkan tiga titik, P , Q dan R di atas permukaan bumi. P dan Q terletak di atas khatulistiwa. NPS ialah Meridian Greenwich dan O ialah pusat bumi. Nyatakan kedudukan titik R .

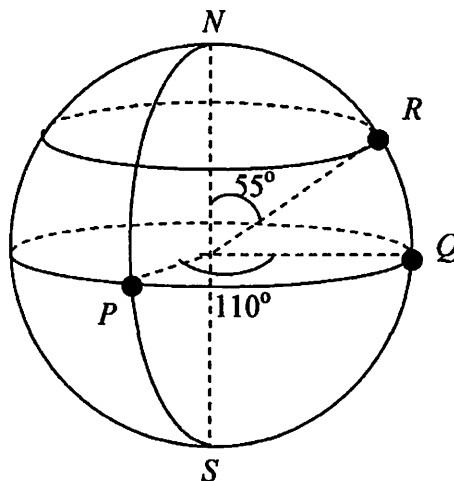


Diagram 18

Rajah 18

- A (35° N ,110° E)
 B (55° N ,110° E)
 C (35° N ,110° W)
 D (55° N ,110° W)
- 19 $(m - 2)(m + 3) + m(m - 4) =$
- A $2m^2 - 3m - 6$
 B $2m^2 - 5m - 6$
 C $2m^2 - 6m - 6$
 D $2m^2 - 9m - 6$

Lihat Halaman Sebelah
 SULIT

- 20 Express $\frac{7}{12n} - \frac{n-4}{4n^2}$ as a single fraction in its simplest form.

Ungkapkan $\frac{7}{12n} - \frac{n-4}{4n^2}$ sebagai satu pecahan tunggal dalam bentuk termudah.

- A $\frac{n-1}{3n^2}$
 B $\frac{n+1}{3n^2}$
 C $\frac{n-3}{3n^2}$
 D $\frac{n+3}{3n^2}$

- 21 Given that $p(q+1) - 3q = 5p$, express q in term of p .

Diberi bahawa $p(q+1) - 3q = 5p$, ungkapkan q dalam sebutan p .

- A $q = \frac{1-4p}{2}$
 B $q = \frac{1-5p}{3-p}$
 C $q = \frac{6p}{p-3}$
 D $q = \frac{4p}{p-3}$

- 22 Given that $\frac{1}{2}(h-3) = 4 - 3(h-2)$, calculate the value of h .

Diberi bahawa $\frac{1}{2}(h-3) = 4 - 3(h-2)$, hitung nilai h .

- A $\frac{5}{4}$
 B $\frac{17}{4}$
 C $\frac{13}{7}$
 D $\frac{23}{7}$

- 23 Which of the following is equivalent to 4^{-3} ?
Antara berikut, yang manakah setara dengan 4^{-3} ?

A $\frac{1}{4^3}$

B $-\frac{1}{4^3}$

C $(-4)^3$

D $4^{\frac{1}{3}}$

- 24 Simplify :
Ringkaskan :

$$\left(pn^{\frac{1}{3}} \right)^6 \times n^2 \div (pn^{-1})$$

A n^3

B n^5

C $p^5 n^3$

D $p^5 n^5$

- 25 List all the integers that satisfy the inequalities $9 - 2x \leq 3$ and $x < 6$.
Senaraikan semua integer yang memuaskan ketaksamaan $9 - 2x \leq 3$ dan $x < 6$

A 3, 6

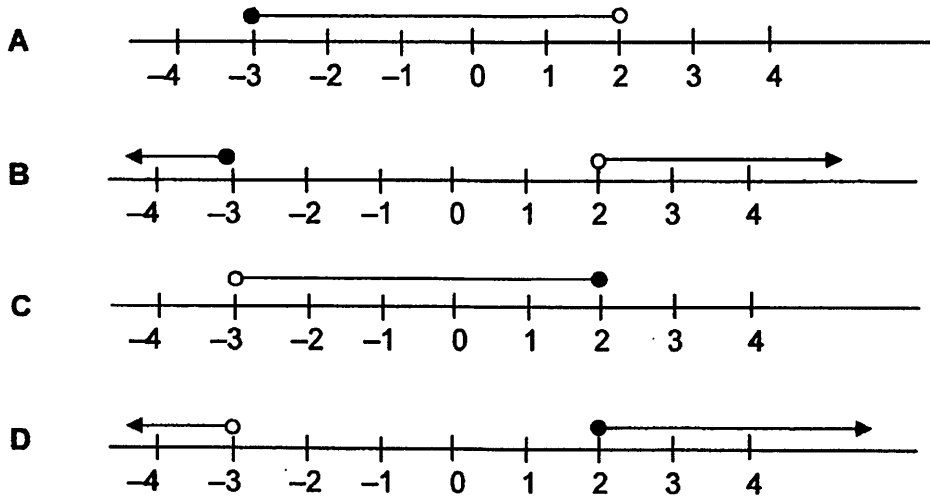
B 4, 5

C 3, 4, 5

D 3, 4, 5, 6

- 26 Which number line represents the solution of the simultaneous linear inequalities $x > -3$ and $4 - x \geq 2$.

Garis nombor manakah yang mewakili penyelesaian bagi ketaksamaan $x > -3$ dan $4 - x \geq 2$.



- 27 Table 27 shows the scores obtained by a group of pupils in a quiz .
Jadual 27 menunjukkan skor yang diperoleh oleh sekumpulan murid dalam satu kuiz.

Score Skor	0	1	2	3	4	5
Frequency Kekerapan	2	2	4	2	6	4

Table 27

Rajah 27

The score mode is

Skor mod ialah

- A 2
B 3
C 4
D 6

Lihat Halaman Sebelah

SULIT

- 28 In diagram 28 the pie chart represent the number of members each of the three uniformed organization in a school.

Dalam diagram 28, carta pai menunjukkan bilangan ahli 3 badan beruniform di sebuah sekolah .



Diagram 28

Rajah 28

There are 220 Police Cadets. The percentages of Scouts is 30%. Calculate the number of Girl Guide.

Terdapat 220 ahli Kadet Polis. Peratus ahli Pengakap ialah 30%. Hitung bilangan ahli Pandu puteri tersebut.

- A 218
- B 220
- C 250
- D 284

Lihat Halaman Sebelah

SULIT

- 29 The table shows the scores obtained by a group of shooters in a shooting competition.

Jadual menunjukkan skor yang di peroleh oleh sekumpulan penembak dalam pertandingan menembak.

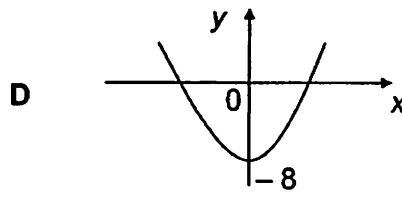
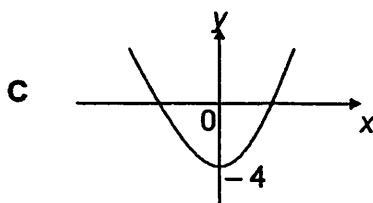
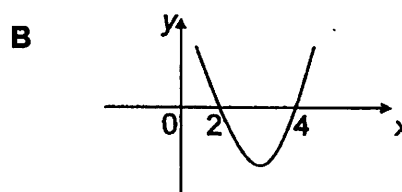
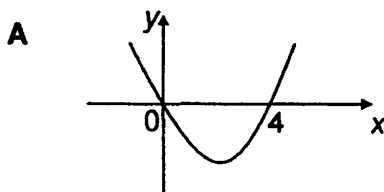
Score Skor	Frequency x Score Kekerapan x Skor
1	4
2	4
3	x
4	16
5	15
6	12

If the total frequency is 17, find the value of x .

Jika jumlah frekuensi ialah 17, cari nilai x .

- A 3
B 6
C 12
D 15
- 30 Which graph represents $y = 2x^2 - 8x$?

Graf manakah yang mewakili $y = 2x^2 - 8x$?



Lihat Halaman Sebelah

SULIT

- 31 In diagram 31, the Venn diagram shows universal set, ξ , set P and Q .
 Dalam Rajah 31, gambarajah Venn menunjukkan set semesta ξ , set P and Q .

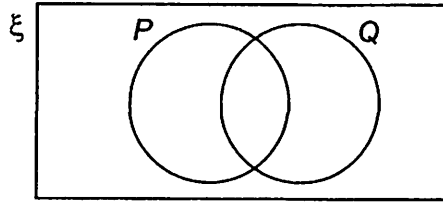


Diagram 31

Rajah 31

Given that $n(P) = 9$, $n(Q) = 13$, $n(P \cap Q) = 5$, $n(P \cup Q)' = 3$. Find $n(\xi)$.

Diberi $n(P) = 9$, $n(Q) = 13$, $n(P \cap Q) = 5$, $n(P \cup Q)' = 3$. Cari $n(\xi)$.

- A 17
 B 20
 C 27
 D 30

- 32 Diagram 32 is a Venn diagram that shows the universal set ξ , A and B .
 Rajah 32 ialah gambar rajah Venn yang menunjukkan set semesta ξ , set A dan set B .

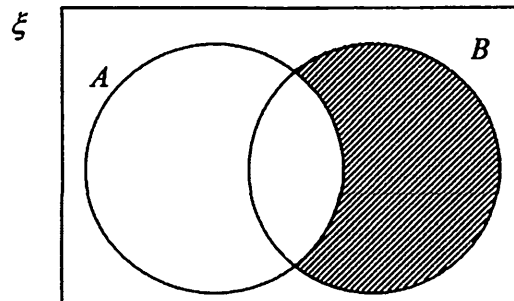


Diagram 32

Rajah 32

The shaded region represents the set

Kawasan berlorek mewakili set

- A $A' \cap B$
 B $A' \cap B'$
 C $B' \cap A$
 D $(B \cap A)'$

Lihat Halaman Sebelah

SULIT

- 33 Given that the straight line $y - 2x + 6 = 0$ is passing through point $B(4, p)$. Find the value of p .

Diberi bahawa garis lurus $y - 2x + 6 = 0$ melalui titik $B(4, p)$. Cari nilai bagi p .

- A 2
- B 3
- C 5
- D 6

- 34 In Diagram 34, GH is a straight line with equation $3y = 2x + 12$

Dalam Rajah 34, GH ialah garis lurus yang mempunyai persamaan $3y = 2x + 12$.

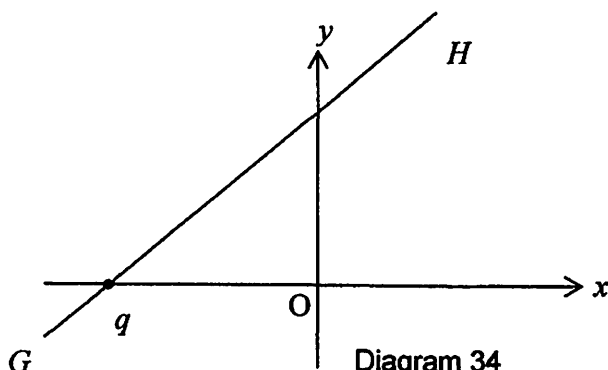


Diagram 34

Rajah 34

Find the value of q

Carikan nilai bagi q

- A $-\frac{2}{3}$
- B $-\frac{3}{4}$
- C -4
- D -6

Lihat Halaman Sebelah

SULIT

- 31 In diagram 31, the Venn diagram shows universal set, ξ , set P and Q .
 Dalam Rajah 31, gambarajah Venn menunjukkan set semesta ξ , set P and Q .

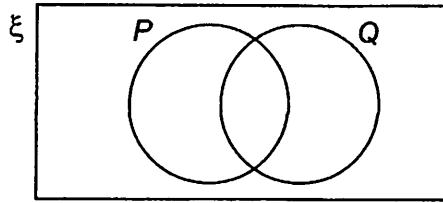


Diagram 31

Rajah 31

Given that $n(P) = 9$, $n(Q) = 13$, $n(P \cap Q) = 5$, $n(P \cup Q)' = 3$. Find $n(\xi)$.

Diberi $n(P) = 9$, $n(Q) = 13$, $n(P \cap Q) = 5$, $n(P \cup Q)' = 3$. Cari $n(\xi)$.

- A 17
- B 20
- C 27
- D 30

- 32 Diagram 32 is a Venn diagram that shows the universal set ξ , A and B .
 Rajah 32 ialah gambar rajah Venn yang menunjukkan set semesta ξ , set A dan set B .

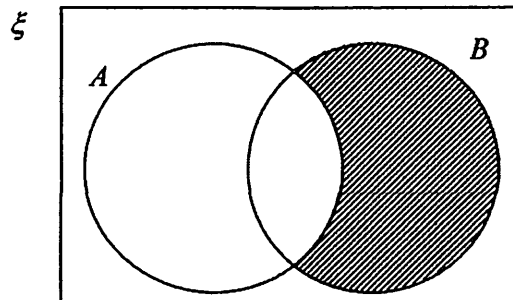


Diagram 32

Rajah 32

The shaded region represents the set

Kawasan berlorek mewakili set

- A $A' \cap B$
- B $A' \cap B'$
- C $B' \cap A$
- D $(B \cap A)'$

Lihat Halaman Sebelah

SULIT

- 33 Given that the straight line $y - 2x + 6 = 0$ is passing through point $B(4, p)$. Find the value of p .

Diberi bahawa garis lurus $y - 2x + 6 = 0$ melalui titik $B(4, p)$. Cari nilai bagi p .

- A 2
- B 3
- C 5
- D 6

- 34 In Diagram 34, GH is a straight line with equation $3y = 2x + 12$

Dalam Rajah 34, GH ialah garis lurus yang mempunyai persamaan $3y = 2x + 12$.

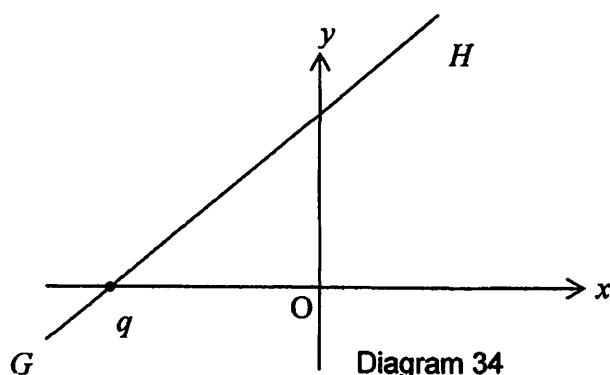


Diagram 34
Rajah 34

Find the value of q

Carikan nilai bagi q

- A $-\frac{2}{3}$
- B $-\frac{3}{4}$
- C -4
- D -6

Lihat Halaman Sebelah

SULIT

- 37 Given that y varies inversely as square root of x and that $y = 20$ when $x = \frac{1}{25}$.

Calculate the value of x when $y = 9$.

Diberi y berubah secara songsang dengan punca kuasa dua x dan $y = 20$

apabila $x = \frac{1}{25}$. Hitung nilai x apabila $y = 9$

A $\frac{2}{3}$

B $\frac{2}{9}$

C $\frac{4}{9}$

D $\frac{16}{81}$

- 38 It is given that R varies directly as the cube of S and inversely as the square of T .
Find the relation between R , S , and T .

Diberi bahawa R berubah secara langsung dengan kuasa tiga S dan secara songsang dengan kuasa dua T .

Cari hubungan antara R , S dan T

A $R \propto \frac{S^3}{\sqrt{T}}$

B $R \propto \frac{\sqrt{T}}{S^3}$

C $R \propto \frac{S^3}{T^2}$

D $R \propto \frac{T^2}{S^3}$

Lihat Halaman Sebelah

SULIT

39 $(4 \ -3) \begin{pmatrix} 6 & 2 \\ 1 & 5 \end{pmatrix} =$

A $(21 \ 7)$

B $\begin{pmatrix} 18 \\ -11 \end{pmatrix}$

C $\begin{pmatrix} 24 & 8 \\ -3 & -15 \end{pmatrix}$

D $\begin{pmatrix} 24 & -6 \\ 4 & -15 \end{pmatrix}$

40 Find the value of x in following matrix equation:

Cari nilai x dalam persamaan matriks berikut :

$$\begin{pmatrix} 9 \\ 6 \end{pmatrix} - 2 \begin{pmatrix} -x \\ 2 \end{pmatrix} = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$$

A -8

B -4

C 5

D 6

**END OF QUESTION PAPER
KERTAS SOALAN TAMAT**

**Lihat Halaman Sebelah
SULIT**