

1449/1
Matematik
Kertas 1
2012

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



MAJLIS PENGETUA SEKOLAH MENENGAH MALAYSIA
CAWANGAN NEGERI SEMBILAN

PEPERIKSAAN PERCUBAAN BERSAMA
SIJIL PELAJARAN MALAYSIA 2012

MATEMATIK

Kertas 1

Satu jam lima belas minit

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.*

Kertas soalan ini mengandungi 31 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

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

**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
*Hasil tambah sudut pedalaman poligon
 = $(n - 2) \times 180^\circ$*

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

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

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

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

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

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

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

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

Answer all questions
Jawab semua soalan

1 Round off 84354 correct to three significant figures.

Bundarkan 84354 betul kepada tiga angka bererti.

- A 843
- B 844
- C 84300
- D 84400

2 Express 4.728×10^{-2} as a single number.

Ungkapkan 4.728×10^{-2} sebagai satu nombor tunggal.

- A 0.04728
- B 0.4728
- C 47.28
- D 472.8

3 $2.13 \times 10^3 + 4.91 \times 10^2 =$

- A 2.62×10^2
- B 2.62×10^3
- C 7.04×10^2
- D 7.04×10^3

4 $11001_2 + 1001_2 =$

- A 101000_2
- B 101010_2
- C 100010_2
- D 100000_2

- 5 Express 154_8 as a number in base five.

Ungkapkan 154_8 sebagai satu nombor dalam asas lima.

- A 413_5
 B 404_5
 C 232_5
 D 204_5

- 6 In Diagram 1, $JKLMN$ is a regular pentagon. PKJ is a straight lines.

Dalam Rajah 1, $JKLMN$ ialah sebuah pentagon sekata. PKJ adalah garis lurus.

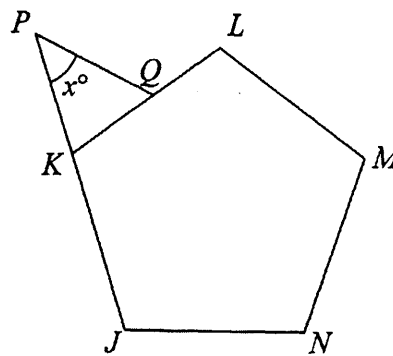


Diagram 1
Rajah 1

$$PK=PQ.$$

Find the value of x .

Cari nilai x .

- A 30
 B 36
 C 72
 D 80

- 7 In Diagram 2, SML and NMR are straight lines.

Dalam Rajah 2, SML dan NMR adalah garis lurus.

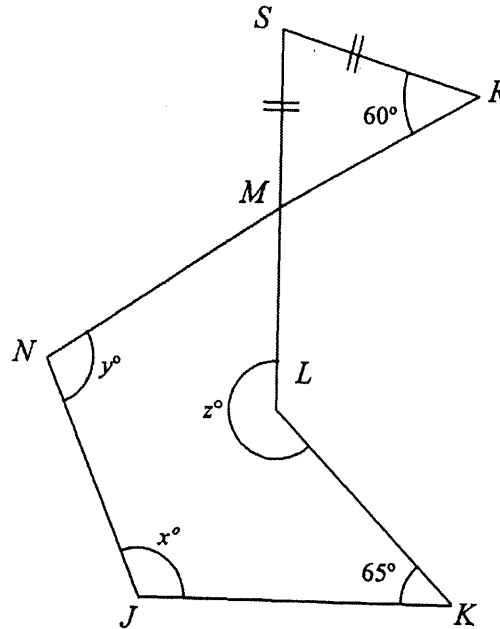


Diagram 2
Rajah 2

Given $x + y = 210^\circ$. Find the value of z .

Diberi $x + y = 210^\circ$. Cari nilai z .

- A 110
- B 125
- C 165
- D 205

8 In Diagram 3, JKL is a tangent to the circle with centre O , at K .

Dalam Rajah 3, JKL ialah tangen kepada bulatan berpusat O , di K .

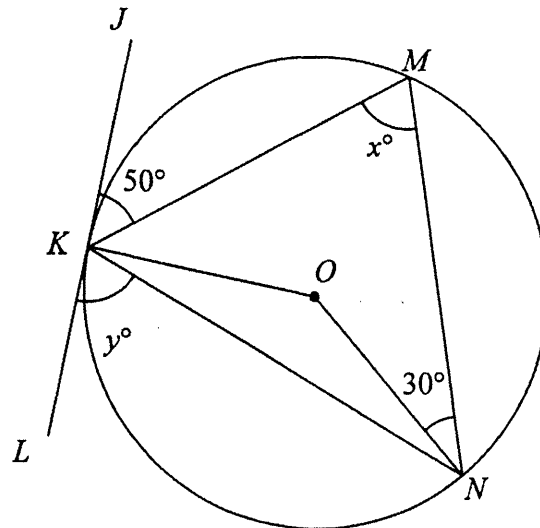


Diagram 3

Rajah 3

Find the value of $x + y$.

Cari nilai $x + y$.

- A 70
- B 80
- C 100
- D 140

- 9 In Diagram 4, five polygons are drawn on a square grid.

Dalam Rajah 4, lima poligon dilukis pada grid segi empat sama.

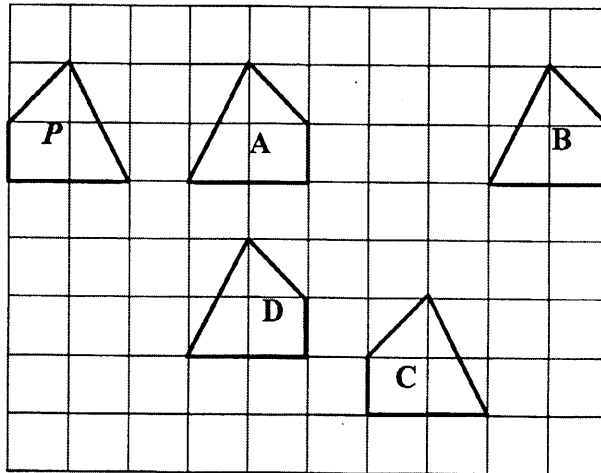


Diagram 4

Rajah 4

Which of the polygon A, B, C or D is the image of polygon P under a translation ?

Antara poligon A, B, C atau D yang manakah imej poligon P di bawah suatu translasi ?

- 10 Diagram 5 shows five quadrilaterals drawn on square grids.

Rajah 5 menunjukkan lima sisi empat dilukis pada grid segi empat sama.

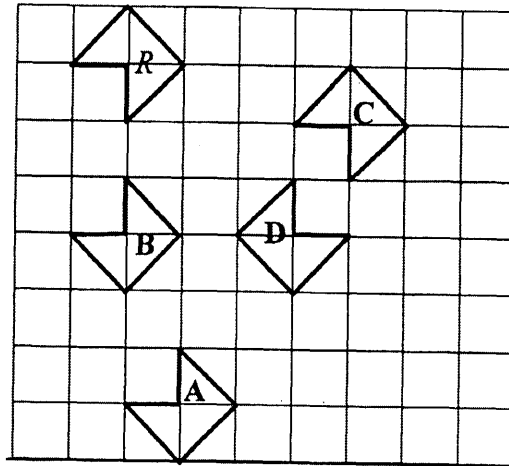


Diagram 5
Rajah 5

Which of the quadrilaterals A, B, C or D, is the image of R under a reflection in a certain line ?

Antara sisi empat A, B, C atau D, yang manakah imej bagi R di bawah suatu pantulan pada garis tertentu?

11 In Diagram 6, KLM is a straight line.

Dalam Rajah 6, KLM ialah garis lurus.

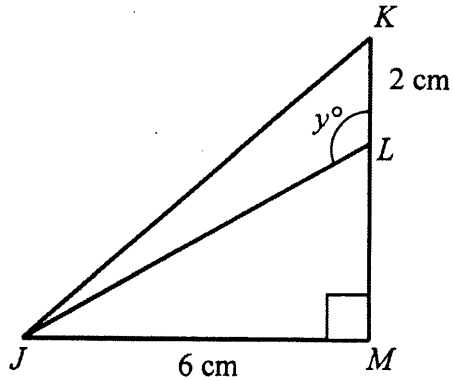


Diagram 6

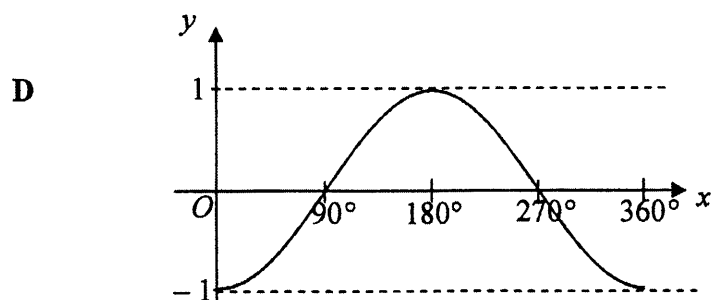
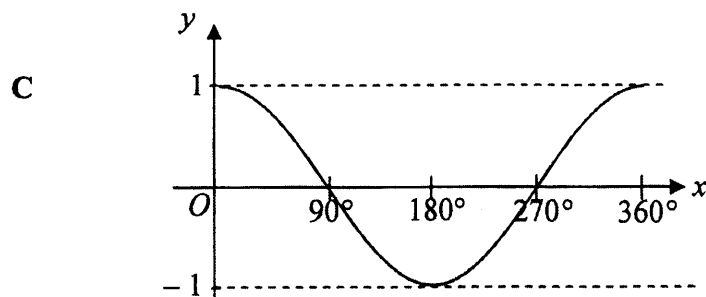
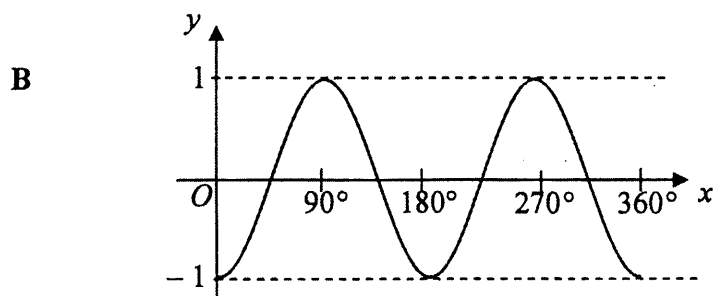
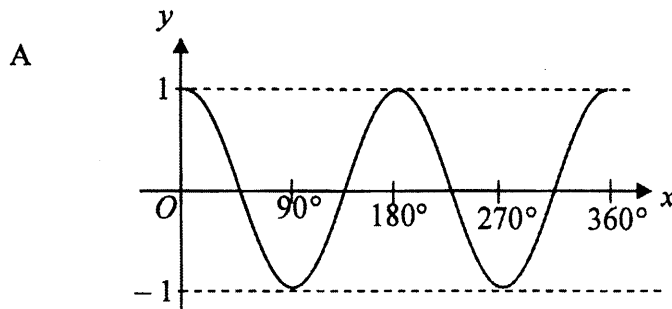
Rajah 6

Given that $\tan \angle KJM = 1$, find the value of $\tan y^\circ$.

Diberi bahawa $\tan \angle KJM = 1$, cari nilai $\tan y^\circ$.

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

- 12 Which of the following graph represents $y = \cos x^\circ$?
Antara graf berikut yang manakah menunjukkan graf $y = \cos x^\circ$?



- 13 Given $\cos x^\circ = -0.7321$ and $180^\circ \leq x \leq 360^\circ$. Find the value of x .

Diberi $\cos x^\circ = -0.7321$ dan $180^\circ \leq x \leq 360^\circ$. Cari nilai x .

- A 222.94°
- B 227.06°
- C 312.94°
- D 317.06°

- 14 Diagram 7 shows a cuboid with a rectangular base $JKLM$.

Rajah 7 menunjukkan sebuah kuboid dengan tapak segi empat tepat $JKLM$.

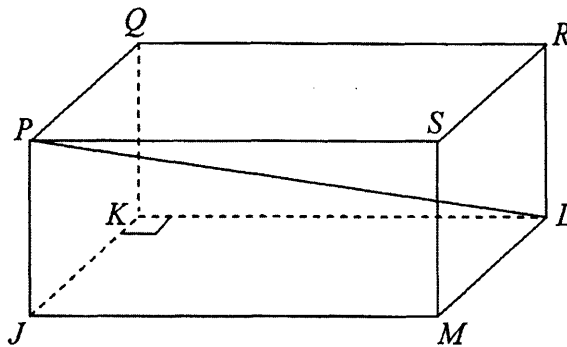


Diagram 7

Rajah 7

Name the angle between the line PL and the base $JKLM$.

Namakan sudut di antara garis PL dan tapak $JKLM$.

- A $\angle PLM$
- B $\angle PLJ$
- C $\angle PLK$
- D $\angle PLS$

- 15 In Diagram 8, J and K are two points on the horizontal plane and L is the top of a vertical flagpole JL .

Dalam Rajah 8, J dan K ialah dua titik pada satah mengufuk dan L ialah puncak sebatang tiang bendera tegak JL .

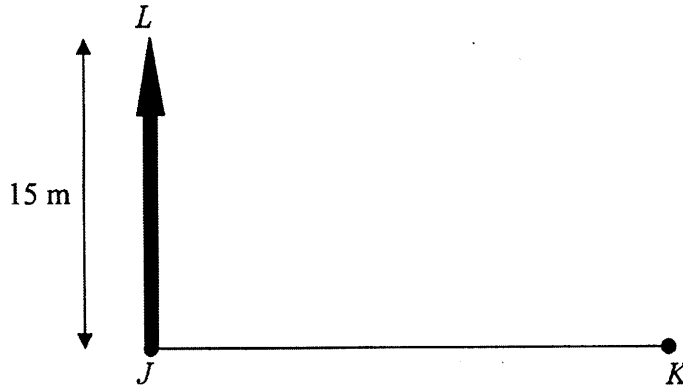


Diagram 8

Rajah 8

The distance between J and K is 25 m. Calculate the angle of elevation of L from K .

Jarak di antara J dan K ialah 25 m. Hitungkan sudut dongakan L dari K .

- A 30.96°
- B 36.87°
- C 53.13°
- D 59.04°

- 16 Diagram 9 shows two vertical tower PQ and RST on a horizontal plane.

Rajah 9 menunjukkan dua buah menara PQ dan RST di atas satah mengufuk.

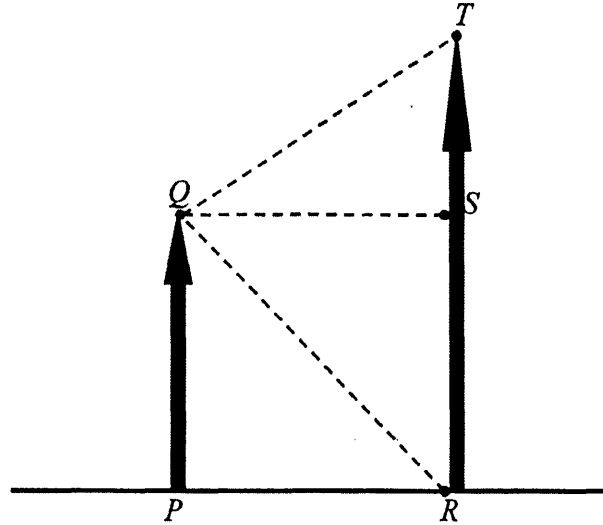


Diagram 9

Rajah 9

$$PQ = RS.$$

The angle of depression of point R from point Q is

Sudut tunduk titik R dari titik Q ialah

- A $\angle RQS$
- B $\angle PQR$
- C $\angle SQT$
- D $\angle RQT$

- 17 Diagram 10 shows three points P , Q and R on a horizontal plane.
Rajah 10 menunjukkan tiga titik P , Q dan R pada satah mengufuk.

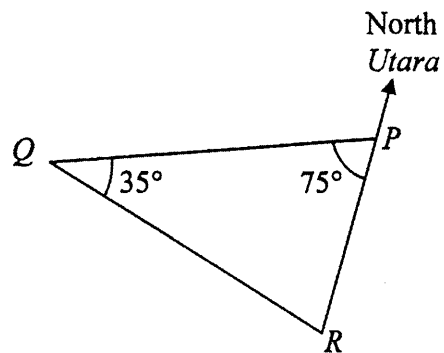


Diagram 10
Rajah 10

Find the bearing of R from Q .

Cari bearing R dari Q .

- A 105°
- B 110°
- C 145°
- D 160°

18 In Diagram 11, N is the North Pole and S is the South Pole.

Dalam Rajah 11, U ialah Kutub Utara dan S ialah Kutub Selatan.

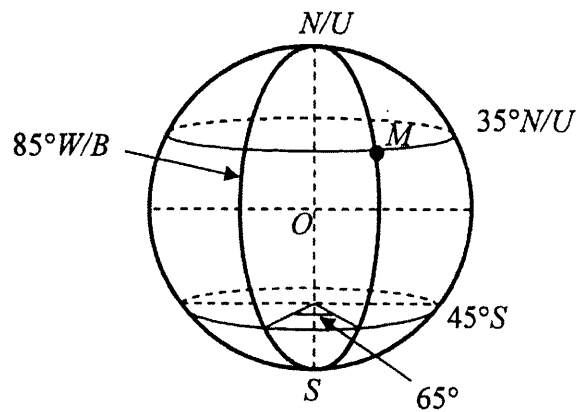


Diagram 11

Rajah 11

The location of point M is

Lokasi titik M ialah

- A (35°N/U, 20°W/B)
- B (35°N/U, 25°E/T)
- C (35°N/U, 30°W/B)
- D (35°N/U, 50°E/T)

19 $2x(y+x) - (x+y)^2 =$

A $x^2 + 2xy - y^2$

B $2x^2 + y^2$

C $x^2 + y^2$

D $x^2 - y^2$

20 Express $\frac{1+m}{2} - \frac{5+3m}{6m}$ as a single fraction in its simplest form.

Ungkapkan $\frac{1+m}{2} - \frac{5+3m}{6m}$ sebagai satu pecahan tunggal dalam bentuk termudah.

A $\frac{3m^2 - 5}{6m}$

B $\frac{3m^2 + 5}{6m}$

C $\frac{m^2 + 5}{6m}$

D $\frac{m^2 - 5}{6m}$

21 Given that $\frac{\sqrt{2-r}}{t} = s$, express r in terms of t and s .

Diberi bahawa $\frac{\sqrt{2-r}}{t} = s$, ungkapkan r dalam sebutan t dan s .

A $s^2 t^2 - 4$

B $st - 2$

C $2 - s^2 t^2$

D $4 - st$

- 22 Given that $\frac{x-3}{3} = \frac{x+1}{5}$, calculate the value of x .

Di beri bahawa $\frac{x-3}{3} = \frac{x+1}{5}$, hitung nilai x .

- A 6
- B 9
- C 2
- D 3

- 23 Simplify $\frac{p^8 \times (16r^4)^{\frac{1}{2}}}{(p^6 r^3)^{\frac{1}{3}}}$.

Ringkaskan $\frac{p^8 \times (16r^4)^{\frac{1}{2}}}{(p^6 r^3)^{\frac{1}{3}}}$.

- A $16p^6 r$
- B $16p^4 r$
- C $4p^6 r$
- D $4p^4 r$

- 24 Given that $x^{2n} = \left(\frac{1}{x^5}\right)^{-4}$, find the value of n .

Diberi bahawa $x^{2n} = \left(\frac{1}{x^5}\right)^{-4}$, cari nilai n .



- A -10
- B -9
- C 0
- D 10

- 25 Find the solution for $2m - 3 \leq \frac{m}{3} + 3$.

Cari penyelesaian bagi $2m - 3 \leq \frac{m}{3} + 3$.

- A 3
 B 4
 C 5
 D 9
- 26 Pictograph in Diagram 12 shows the number of cars sold in January 2012. The number of Camry sold are not shown.

Piktograf dalam Rajah 12 menunjukkan bilangan kereta yang dijual pada bulan Januari 2012. Bilangan Camry yang dijual tidak ditunjukkan.

Vios	
Innova	
Camry	



Represent 20 cars
 Mewakili 20 kereta

Diagram 12

Rajah 12

Vios sold is 50% of total sales in the month. Find the number of Camry sold on January 2012.

Vios yang dijual adalah 50% daripada jumlah jualan dalam bulan itu. Cari bilangan Camry yang dijual pada Januari 2012

- A 20
 B 30
 C 40
 D 60

27 Table 1 shows the number of pets belongs to a student in a class.

Jadual 1 menunjukkan bilangan haiwan peliharaan yang dimiliki oleh pelajar dalam sebuah kelas.

Number of pets <i>Bilangan haiwan peliharaan</i>	1	2	3	4	5	6
Number of Students <i>Bilangan pelajar</i>	6	3	2	1	6	3

Table 1

Jadual 1

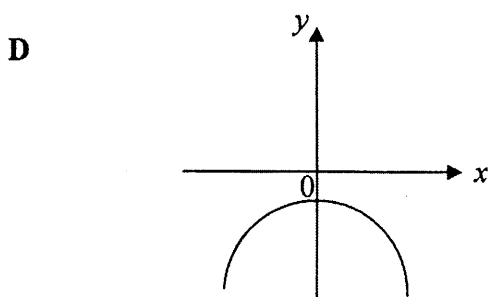
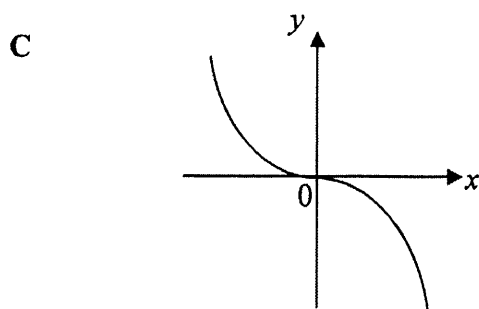
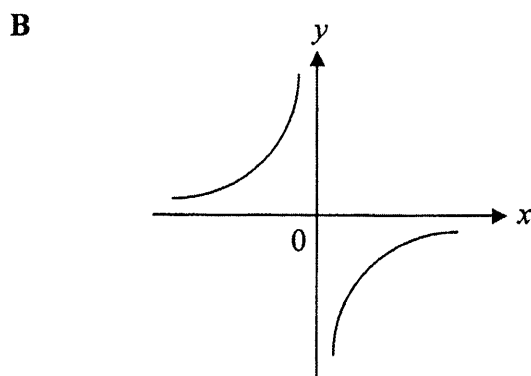
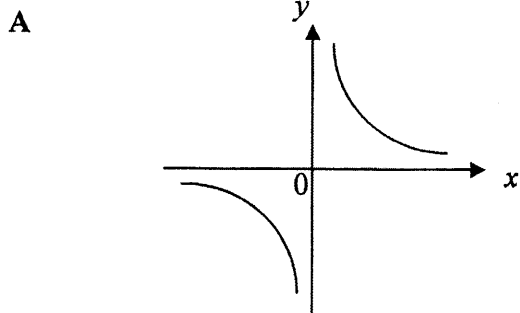
Find the median of the data .

Cari median bagi data tersebut.

- A 2
- B 3
- C 4
- D 5

28 Which graph represents $y = -\frac{3}{x}$?

Antara graf berikut, yang manakah mewakili $y = -\frac{3}{x}$?



- 29 Diagram 13 is a Venn diagram showing the universal set ξ , set P , set Q and set R .
Rajah 13 ialah gambar rajah Venn yang menunjukkan set semesta ξ , set P , set Q dan set R .

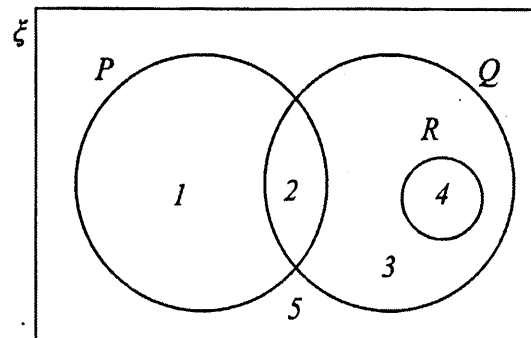


Diagram 13

Rajah 13

Region $(P \cup Q) \cap R'$ is represent by

Rantau $(P \cup Q) \cap R'$ adalah diwakili

- A 1, 2, 3
- B 1, 2, 5
- C 2, 3, 4
- D 3, 4, 5

- 30 Diagram 14 is a Venn diagram showing the universal set ξ , set P , set Q and set R .
Rajah 14 ialah gambar rajah Venn yang menunjukkan set semesta ξ , set P , set Q dan set R .

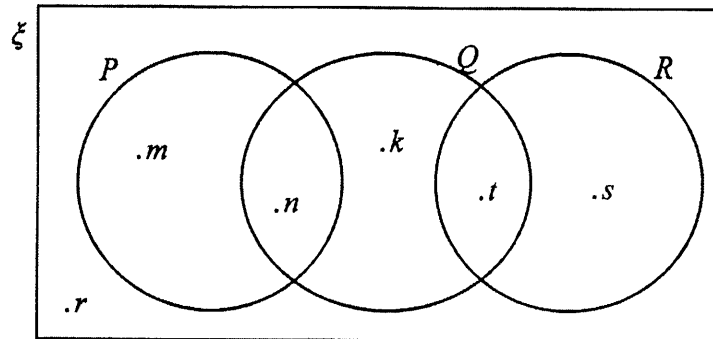


Diagram 14

Rajah 14

Find the value of $n(Q \cup R')$.

Cari nilai bagi $n(Q \cup R')$.

- A 2
- B 3
- C 4
- D 5

- 31 Diagram 15 shows a Venn diagram with the universal set $\xi = \{\text{Form five students}\}$. $M = \{\text{students who passed Mathematics test}\}$ and $S = \{\text{students who passed Science test}\}$.
Rajah 15 menunjukkan gambar rajah Venn dengan set semesta $\xi = \{\text{pelajar Tingkatan lima}\}$. $M = \{\text{pelajar yang lulus ujian Matematik}\}$ dan set $S = \{\text{pelajar yang lulus ujian Sains}\}$.

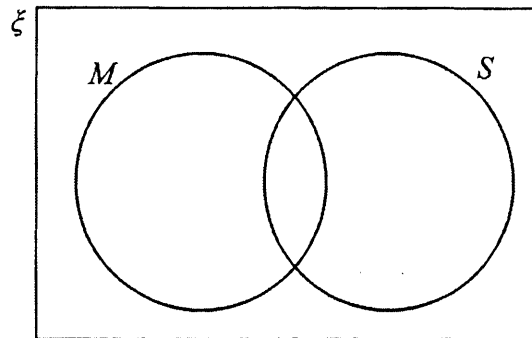


Diagram 15

Rajah 15

Given $n(M) = 92$, $n(S) = 74$, $n(M \cap S) = 50$ and the number of students who did not pass either subject is 6. Calculate the total number of form 5 students.

Diberi $n(M) = 92$, $n(S) = 74$, $n(M \cap S) = 50$ dan bilangan pelajar yang tidak lulus mana-mana subjek ialah 6. Hitung jumlah pelajar tingkatan 5.

- A 222
- B 216
- C 172
- D 122

32 In Diagram 16, MN is a straight line and distance of MN is 13.

Dalam Rajah 16, MN ialah satu garis lurus dan jarak MN ialah 13.

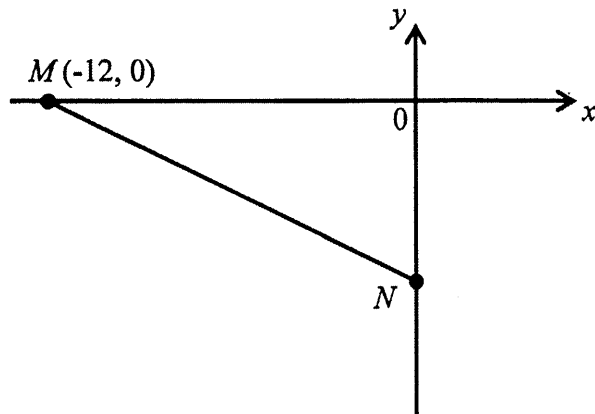


Diagram 16

Rajah 16

Find the gradient of MN ?

Cari kecerunan MN ?

A $-\frac{12}{5}$

B $-\frac{5}{12}$

C $\frac{5}{12}$

D $\frac{12}{5}$

- 33 Diagram 17 shows a straight line PQ on the Cartesian plane. It is given that the gradient of PQ is $-\frac{1}{2}$.

Rajah 17 menunjukkan suatu garis lurus PQ pada satah Cartesian. Diberi bahawa kecerunan PQ ialah $-\frac{1}{2}$.

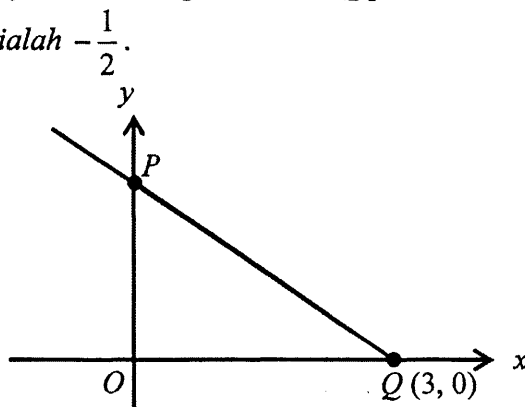


Diagram 17 / Rajah 17

Find the y -intercept of straight line PQ .

Cari pintasan- y bagi garis lurus PQ .

- A 6
- B 3
- C $\frac{3}{2}$
- D $-\frac{3}{2}$
- 34 There are 30 red chips and x yellow chips in a box. One chip is chosen at random from the box. The probability of choosing a red chip is $\frac{5}{8}$. Find the value of x .
- Terdapat 30 cip merah dan x cip kuning di dalam sebuah kotak. Sebiji cip dipilih secara rawak daripada kotak itu. Kebarangkalian cip merah dipilih ialah $\frac{5}{8}$.
- Cari nilai x .
- A 10
- B 12
- C 15
- D 18

- 35 Rahim has 7 blue pens and 8 red pens. He receives 5 blue pens and 10 red pens from his brother. He puts all the pens in a box. If a pen is chosen at random from the box, state the probability that the blue pen is chosen.

Rahim mempunyai 7 pen biru dan 8 pen merah. Beliau menerima 5 pen biru dan 10 pen merah dari abangnya. Dia meletakkan semua pen dalam sebuah kotak. Jika sebatang pen dipilih secara rawak daripada kotak itu, nyatakan kebarangkalian bahawa pen biru dipilih.

- A $\frac{1}{3}$
B $\frac{1}{6}$
C $\frac{2}{5}$
D $\frac{3}{5}$

- 36 If p varies directly as the square root of q , and $p = 32$ when $q = 16$. Calculate the value of p when $q = 4$.

Jika p berubah secara langsung dengan punca kuasa dua q , dan $p = 32$ apabila $q = 16$. Hitung nilai p apabila $q = 4$.

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

- 37 Table 2 shows some values of variable X and Y . If X varies inversely with Y and $cd = 12$. Calculate the value of p .

Jadual 2 menunjukkan beberapa nilai pembolehubah X dan Y . Jika X berubah secara songsang dengan Y dan $cd = 12$. Hitung nilai p .

X	c	p
Y	d	18

Table 2
Jadual 2

- A 4
- B 3
- C $\frac{3}{4}$
- D $\frac{2}{3}$
- 38 It is given $p \propto \frac{q^2}{t}$ and $p = 24$ when $q = 6$ and $t = 9$. Calculate the value of q when $p = 15$ and $t = 10$.
- Diberi $p \propto \frac{q^2}{t}$ dan $p = 24$ bila $q = 6$ dan $t = 9$. Kira nilai q bila $p = 15$ dan $t = 10$.*
- A 4
- B 5
- C 6
- D 25
- 39 Given $\begin{pmatrix} 0 & -1 \\ 3 & 2 \end{pmatrix} + 3\begin{pmatrix} 2 & 0 \\ m & 1 \end{pmatrix} = \begin{pmatrix} 6 & -1 \\ -12 & 5 \end{pmatrix}$. Find the value of m .
- Diberi $\begin{pmatrix} 0 & -1 \\ 3 & 2 \end{pmatrix} + 3\begin{pmatrix} 2 & 0 \\ m & 1 \end{pmatrix} = \begin{pmatrix} 6 & -1 \\ -12 & 5 \end{pmatrix}$. Cari nilai m .*
- A -5
- B -3
- C 3
- D 5

40 $\begin{pmatrix} -3 \\ 2 \end{pmatrix} \begin{pmatrix} -5 & 4 \end{pmatrix} =$

A (23)

B $(15 \ 8)$

C $\begin{pmatrix} 15 & -10 \\ 12 & 8 \end{pmatrix}$

D $\begin{pmatrix} 15 & -12 \\ -10 & 8 \end{pmatrix}$

END OF QUESTION PAPER

KERTAS SOALAN TAMAT

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. Then blacken the space for the new answer.
Sekiranya anda hendak menukarkan jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.
6. The diagrams in the questions provided are not drawn to scale unless stated.
Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan.
7. A list of formulae is provided on pages 2 to 4.
Satu senarai rumus disediakan di halaman 2 hingga 4.
8. A booklet of four-figure mathematical tables can be used.
Buku sifir matematik empat angka boleh digunakan.
9. You may use a non-programmable scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.

1449/1
Mathematics
Kertas 1
2012



MAJLIS PENGETUA SEKOLAH MENENGAH MALAYSIA

CAWANGAN NEGERI SEMBILAN

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PEPERIKSAAN PERCUBAAN BERSAMA
SIJIL PELAJARAN MALAYSIA 2012

MATHEMATICS

Kertas 1

PERATURAN PEMARKAHAN

<http://tutormansor.wordpress.com/>

PEPERIKSAAN PERCUBAAN SPM 2012

MATHEMATICS
Kertas 1

1. D	11. C	21. C	31. D
2. A	12. C	22. B	32. B
3. B	13. A	23. C	33. C
4. C	14. B	24. D	34. D
5. A	15. A	25. A	35. C
6. B	16. A	26. C	36. D
7. D	17. B	27. B	37. D
8. D	18. A	28. B	38. B
9. C	19. D	29. A	39. A
10. B	20. A	30. D	40. D