

1449/1
Mathematics
Paper 1
September
2008

PERSIDANGAN KEBANGSAAN PENGETUA-PENGETUA
SEKOLAH MENENGAH MALAYSIA (PKPSM) CAWANGAN MELAKA



PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2008

MATHEMATICS

Paper 1

1 hour and fifteen minutes



DO NOT OPEN THIS QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO

1. This question paper is bilingual.
2. Answer **all** questions.
3. Each question is followed by four choices of answers **A, B, C** and **D**.
4. For each question, choose **one** answer only.
5. The diagrams given are not drawn according to scale unless stated.
6. A list of formulae is given on pages 2 and 3.
7. Non programmable scientific calculator is allowed.

This question paper consists of 21 printed pages

INFORMATION FOR CANDIDATES

1. *This question paper consists of **40** questions.*
2. *Answer **all** questions.*
3. *Answer each question by blackening the correct space on the answer sheet .*
4. *Blacken only **one** space for each question.*
5. *If you wish to change your answer, erase the blackened mark that you have done. Then blacken the space for the new answer.*
6. *The diagrams in the questions provided are not drawn to scale unless stated .*
7. *A list of formulae is provided on pages 3 to 4.*
8. *A booklet of four-figure mathematical tables is provided.*
9. *You may use a non-programmable scientific calculator.*

MAKLUMAT UNTUK CALON

1. *Kertas soalan ini mengandungi 40 soalan.*
2. *Jawab **semua** soalan.*
3. *Jawab dengan menghitamkan ruangan yang betul pada kertas jawapan.*
4. *Bagi setiap soalan hitamkan satu ruangan sahaja.*
5. *Sekiranya anda hendak menukar jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.*
6. *Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan*
7. *Satu senarai rumus disediakan di halaman 3 hingga 4.*
8. *Sebuah buku sifir matematik empat angka disediakan.*
9. *Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.*

MATHEMATICAL FORMULAE

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

RELATIONS

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

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

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

$$4 \quad A^{-1} = \frac{1}{ad-bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$$

$$5 \quad P(A) = \frac{n(A)}{n(S)}$$

$$6 \quad P(A') = 1 - P(A)$$

$$7 \quad \text{Distance} = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

$$8 \quad \text{Midpoint, } (x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$9 \quad \text{Average speed} = \frac{\text{distance travelled}}{\text{time taken}}$$

$$10 \quad \text{Mean} = \frac{\text{sum of data}}{\text{number of data}}$$

$$11 \quad \text{Min} = \frac{\text{sum of (class mark} \times \text{frequency)}}{\text{sum of frequencies}}$$

12 Pythagoras Theorem

$$c^2 = a^2 + b^2$$

$$13 \quad m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$14 \quad m = -\frac{\text{y-intercept}}{\text{x-intercept}}$$

SHAPES AND SPACE

- 1 Area of trapezium = $\frac{1}{2} \times \text{sum of parallel sides} \times \text{height}$
- 2 Circumference = $\pi d = 2\pi r$
- 3 Area of circle = πr^2
- 4 Curved surface area of cylinder = $2\pi rh$
- 5 Surface area of sphere = $4\pi r^2$
- 6 Volume of right prism = cross sectional \times length
- 7 Volume of cylinder = $\pi r^2 h$
- 8 Volume of cone = $\frac{1}{3} \pi r^2 h$
- 9 Volume of sphere = $\frac{4}{3} \pi r^3$
- 10 Volume of right pyramid = $\frac{1}{3} \times \text{base area} \times \text{height}$
- 11 Sum of interior angles of a polygon = $(n - 2) \times 180^\circ$
- 12
$$\frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$
- 13
$$\frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$
- 14 Scale factor, $k = \frac{PA'}{PA}$
- 15 Area of image = $k^2 \times \text{area of object}$.

Answer **all** question

- 1 Round off 0.070256 correct to three significant figures .
Bundarkan 0.070256 betul kepada tiga angka bererti.

A 0.07
B 0.070
C 0.0703
D 0.07026

- 2 Express 4.052×10^5 as a single number
Ungkapkan 4.052×10^5 sebagai satu nombor tunggal.

A 4052
B 40520
C 405200
D 4052000

- 3 $6.82 \times 10^4 + 2.1 \times 10^3 =$

A 8.92×10^4
B 7.03×10^4
C 8.92×10^3
D 7.03×10^3

- 4 $10101_2 + 111_2 =$

A 10010_2
B 11010_2
C 11100_2
D 11111_2

- 5 Express 176_8 as a number in base five.
Ungkapkan 176_8 sebagai nombor asas lima.

A 101_5
B 126_5
C 231_5
D 1001_5

- 6 In Diagram 1 $PQRST$ is five of vertices in sequence of regular octagon and $QRUVW$ is a regular pentagon

Dalam Rajah 1, $PQRST$ ialah lima bucu berturutan sebuah oktagon sekata. $QRUVW$ ialah sebuah pentagon sekata.

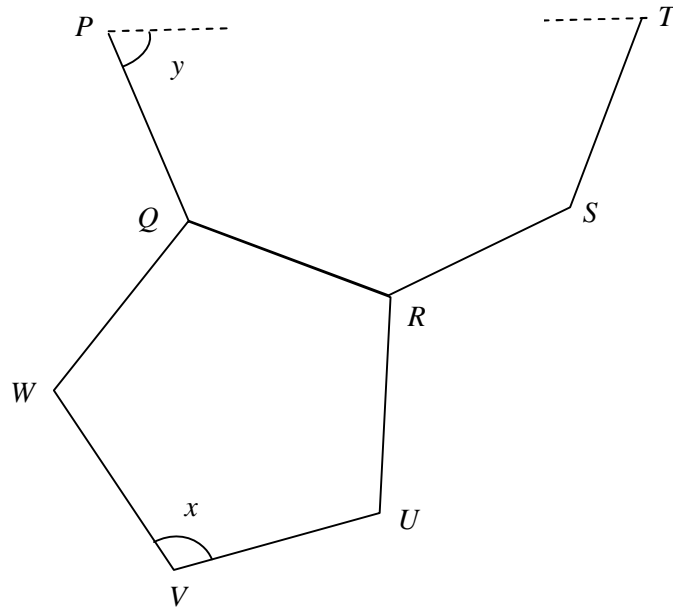


Diagram 1
Rajah 1

Find the value of $x + y$ in degree .

Cari nilai $x + y$ dalam darjah.

- A 153
- B 165.5
- C 175.5
- D 243

- 7 In Diagram 2, $ABCD$ is a rhombus and EAB and BDF is a straight line
 Dalam Rajah 2 $ABCD$ ialah sebuah rombus. EAB dan BDF ialah garis lurus.

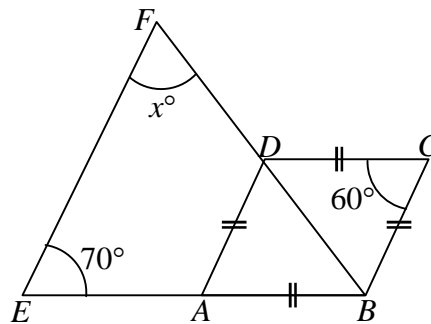


Diagram 2
 Rajah 2

Find the value of x

Cari nilai x

- A 40
- B 50
- C 55
- D 60

- 8 Diagram 3 shows a circle STQ with centre O . Line PQR and SR is a tangent to the circle at Q and at S

Rajah 3 menunjukkan sebuah bulatan STQ berpusat O . Garis PQR dan SR ialah tangen kepada bulatan di Q dan di S .

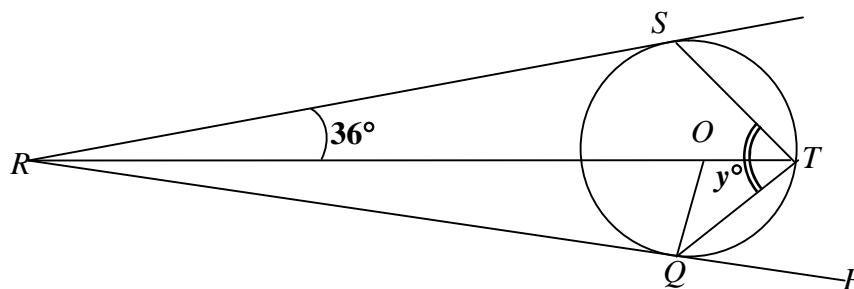


Diagram 3
 Rajah 3

Find the value of y .

Cari nilai y .

- A 27
- B 36
- C 54
- D 72

- 9 Diagram 4 shows S' is an image of S under a rotation.
Rajah 4 menunjukkan S' ialah imej bagi S di bawah satu putaran

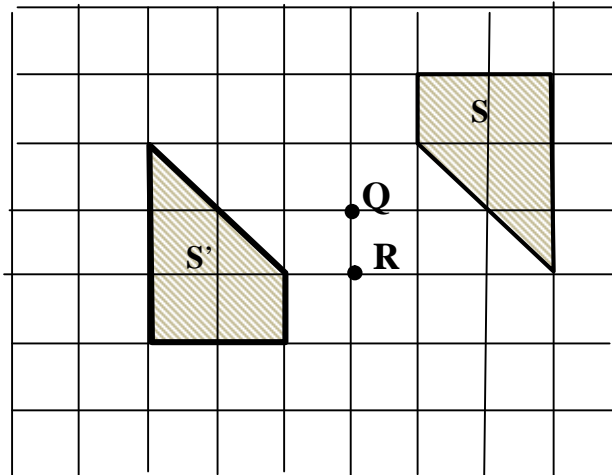


Diagram 4

Rajah 4

Which statement represent the rotation above?
Kenyataan yang manakah mewakili putaran di atas ?

- A** Rotation 90° clock wise at centre R
Putaran 90° ikut arah jam pada R
- B** Rotation 90° anti - clock wise at centre Q
Putaran 90° ikut arah lawan jam pada Q
- C** Rotation 180° at centre R
Putaran 180° pada R
- D** Rotation 180° at centre Q
Putaran 180° pada Q

- 10 Diagram 5 shows point A, B, C, D and P in a Cartesian plane

Rajah 5 menunjukkan titik A, B, C, D dan P pada satah Cartesian.

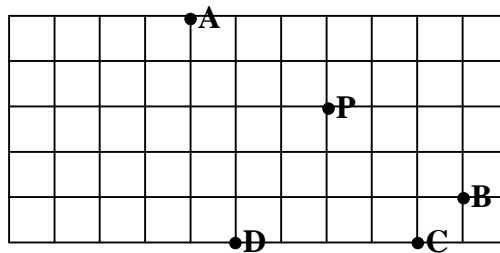
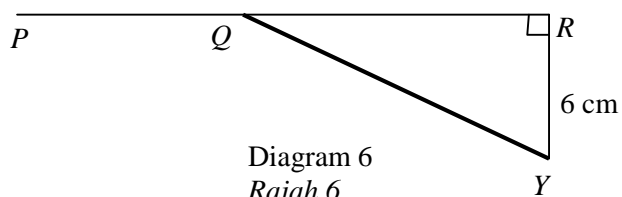


Diagram 5
Rajah5

Which of the point A, B, C or D , is image of point P under a translation $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$

Antara titik A, B, C dan D , yang manakah imej bagi titik P di bawah translasi $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$.

- 11 In Diagram 6, PQR is a straight line.
 Dalam Rajah 6, PQR ialah garis lurus.



Given $\tan \angle RQY = \frac{3}{4}$. Find the value of $\cos \angle PQY$

Diberi $\tan \angle RQY = \frac{3}{4}$. Cari nilai kos $\angle PQY$

- A $\frac{3}{5}$
 B $\frac{4}{5}$
 C $-\frac{3}{5}$
 D $-\frac{4}{5}$
- 12 In diagram 7, O is a centre of a unit circle
 Dalam Rajah 7, O ialah pusat bulatan unit.

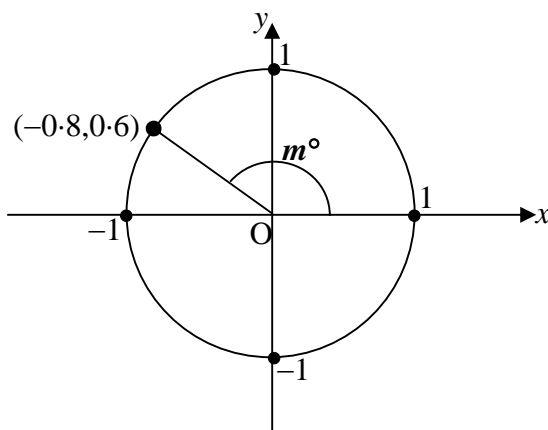


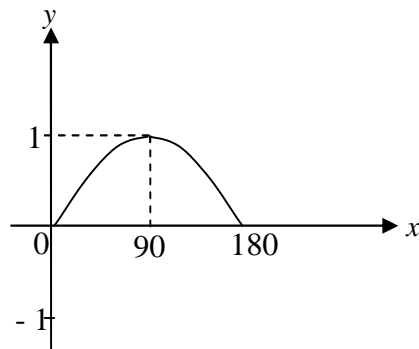
Diagram 7
Rajah 7

Find the value of $\cos m^\circ$
 Carikan nilai kos m° .

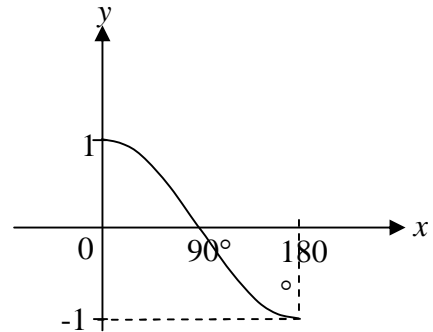
- A 0.6
 B -0.8
 C -0.75
 D -1.33

- 13 Which of the following graphs represent $y = \cos x^\circ$ for $0^\circ \leq x \leq 180^\circ$?
 Antara berikut, yang manakah mewakili graf $y = \cos x^\circ$ untuk $0^\circ \leq x \leq 180^\circ$?

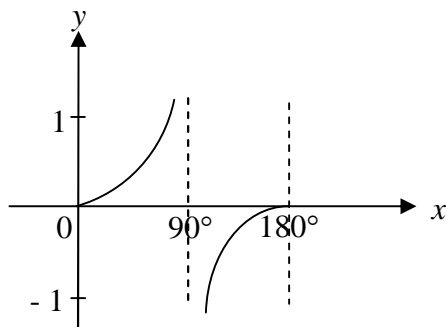
A



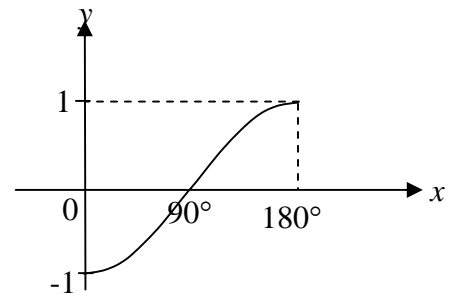
B



C



D



- 14 Diagram 8 shows a right prism with $ELKG$ as a base.
 Rajah 8 menunjukkan sebuah prisma tegak dengan tapak $ELKG$.

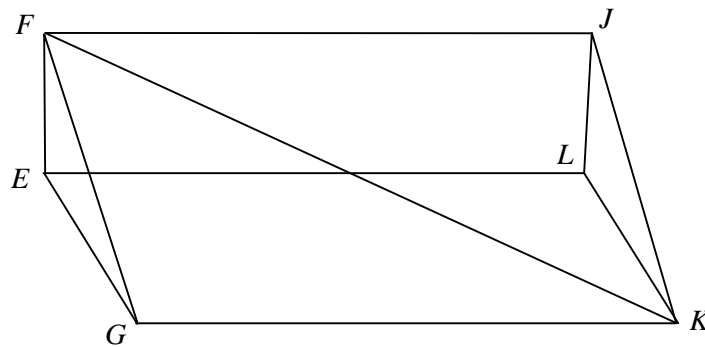


Diagram 8
 Rajah 8

Name the angle between line FK and plane $ELKG$.
 Namakan sudut antara garis FK dan satah $ELKG$.

- A $\angle KFE$
- B $\angle KEF$
- C $\angle FKE$
- D $\angle KGF$

- 15 Diagram 9 shows two vertical poles, PQ and RS , on a horizontal plane. The angle of depression of vertex R from vertex P is 35° and $PQ = 2RS$.
Rajah 9 menunjukkan dua batang tiang tegak, PQ dan RS , yang terletak pada permukaan mengufuk. Sudut tunduk puncak P dari puncak A ialah 35° dan $PQ = 2RS$.

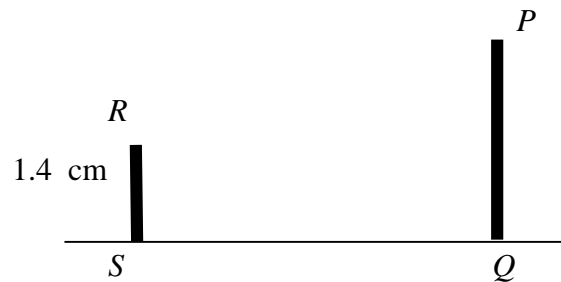


Diagram 9
Rajah 9

Find the distance of QS , in cm correct to one decimal places.
Cari panjang QS , dalam cm betul kepada satu tempat perpuluhan

- A 1.2
B 1.4
C 1.6
D 2.0
- 16 Diagram 10 shows three points, X , Y , and Z on a horizontal plane.
Rajah 10 menunjukkan tiga titik X , Y , dan Z di atas tanah mengufuk.

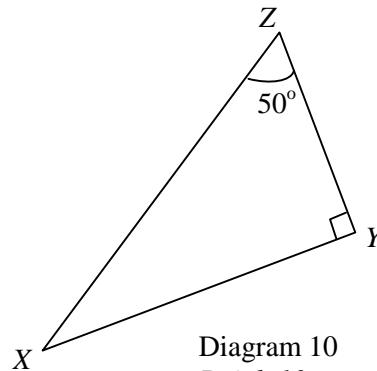


Diagram 10
Rajah 10

It is given that bearing X from Y is 235° . Find the bearing X from Z .
Diberi bearing X dari Y ialah 235° . Cari bearing X dari Z .

- A 015°
B 040°
C 195°
D 220°

- 17 In Diagram 11 P and Q are two points on the surface of the earth
 Dalam Rajah 11, P dan Q ialah dua titik di permukaan bumi.

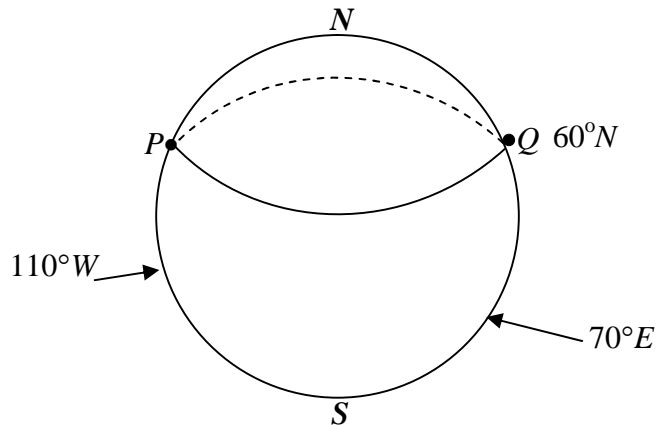


Diagram 11
 Rajah 11

Calculate the shortest distance in nautical miles from P to Q
 Hitung jarak terpendek, dalam batu nautika, dari P ke Q .

- A 3600
 B 7200
 C 10800
 D 5400
- 18 K and L are 2 points on the surface of the earth with KL as the diameter of the earth. Given $L(43^\circ \text{ S}, 107^\circ \text{ E})$ The longitude of K is

K dan L ialah 2 titik di permukaan bumi dengan KL ialah diameter bumi
 Diberi $L(43^\circ \text{ S}, 107^\circ \text{ T})$. Longitud K ialah

- A 43° N
 B 137° N
 C 73° W
 D 107° W
- 19 $2(m-3)^2 + 3 - 2m^2 =$
- A $21 - 12m$
 B $11m - 2$
 C $12m - 2$
 D $21 - 8m$

- 20 Given that $\frac{2}{\sqrt{p}} - 3 = 5$, find the value of p .

Diberi $\frac{2}{\sqrt{p}} - 3 = 5$, cari nilai p

- A $\frac{1}{16}$
 B $\frac{1}{8}$
 C $\frac{1}{4}$
 D $\frac{1}{2}$
- 21 $\frac{3}{5p} - \frac{p-5}{10p^2} =$
- A $\frac{p-1}{2p^2}$
 B $\frac{p+1}{2p^2}$
 C $\frac{5p-1}{2p^2}$
 D $\frac{5p+1}{2p^2}$

- 22 Given that $\frac{x+3}{2} + 1 = x - 4$, find the value of x .

Diberi bahawa $\frac{x+3}{2} + 1 = x - 4$, carikan nilai x .

- A -12
 B -13
 C 12
 D 13
- 23 If $(x^2)^{-4} = \frac{1}{x^{m+5}}$, then $m =$
- Jika $(x^2)^{-4} = \frac{1}{x^{m+5}}$, maka $m =$
- A -13
 B -3
 C 3
 D 13

24 Simplify $(4e^{-2}f)^2 \div 8e^{-7}f^3$.

Permudahkan $(4e^{-2}f)^2 \div 8e^{-7}f^3$.

- A $\frac{1}{2}e^{-9}f^{-1}$
 B $\frac{1}{2}e^5f^5$
 C $2e^3f^{-1}$
 D $2e^5f^5$

25 List all the integers x that satisfy the inequalities $5 - x \geq 1$ and $x > 2 + \frac{x}{5}$.

Senaraikan semua integer x yang memuaskan ketaksamaan $5 - x \geq 1$ dan $x > 2 + \frac{x}{5}$.

- A 3, 4
 B 2, 3, 4
 C 1, 2, 3, 4
 D 3, 4, 5, 6

26 Diagram 12 is a bar chart showing the number of tourists who visited five different recreational centers, P , Q , R , S dan T .

Rajah 12 ialah sebuah carta palang yang menunjukkan bilangan pelancong yang melawat lima buah pusat rekreasi, P , Q , R , S dan T .

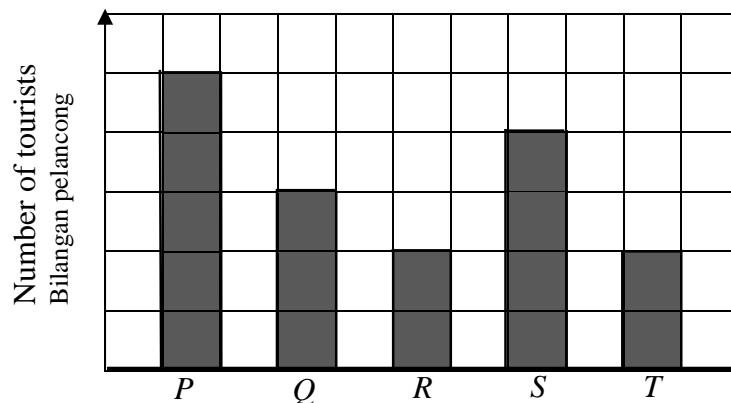


Diagram 12
Rajah 12



700 tourists visited the recreational center, R . Find the difference between the number of tourists who visited the recreational center, P and that of S .

Jika 700 orang pelancong melawat pusat rekreasi, R , carikan beza di antara bilangan pelancong yang melawat pusat rekreasi P dengan pusat rekreasi S .

- A 300
 B 350
 C 400
 D 450

- 27 Diagram 13 is a pictograph which shows the number of laptops sold in the first four months of a particular year by a computer shop. The number of laptops sold in March and April are not shown.

Rajah 13 ialah sebuah piktograf yang menunjukkan bilangan komputer riba yang dijual dalam empat bulan pertama bagi satu tahun tertentu oleh sebuah kedai komputer. Bilangan komputer riba yang dijual dalam bulan Mac dan April tidak ditunjukkan.

January	
February	
March	
April	


 represents 15 laptops
mewakili 15 komputer riba

Diagram 13
Rajah 13

The total of 225 laptops were sold in the four months. The number of laptops sold in March was twice the number sold in April. The number of laptops sold in April was

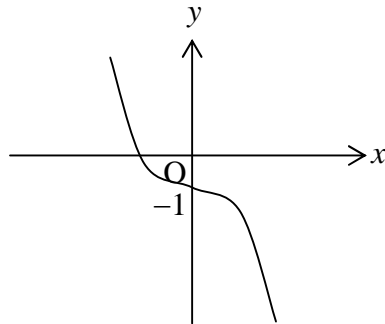
Sejumlah 225 komputer riba telah dijual dalam empat bulan tersebut. Bilangan komputer riba yang dijual dalam bulan Mac adalah dua kali ganda bilangan yang dijual dalam bulan April. Bilangan komputer riba yang dijual dalam bulan April ialah

- A 30
- B 40
- C 60
- D 90

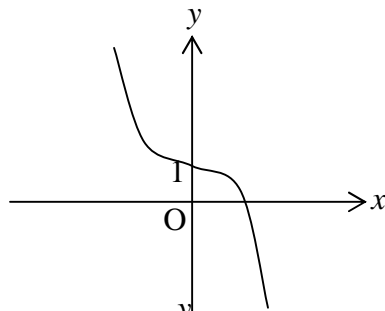
28 Which of the following represents $y = -x^3 + 1$?

Antara yang berikut, manakah mewakili graf bagi $y = -x^3 + 1$?

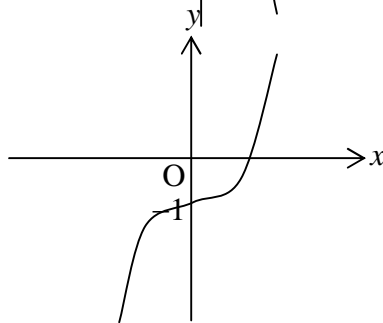
A



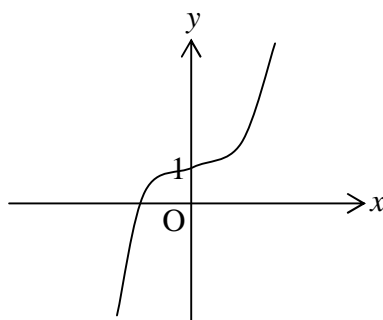
B



C



D



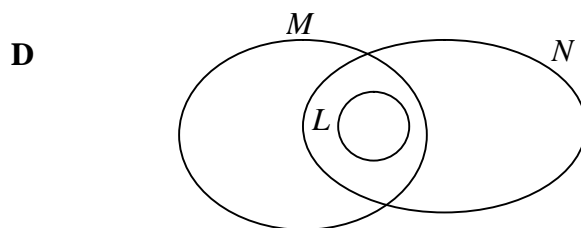
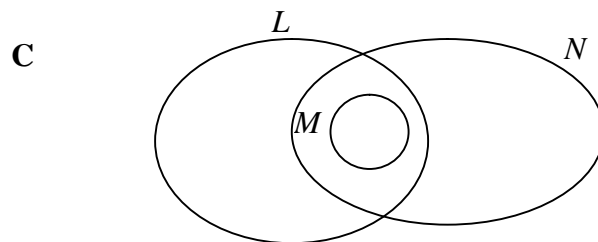
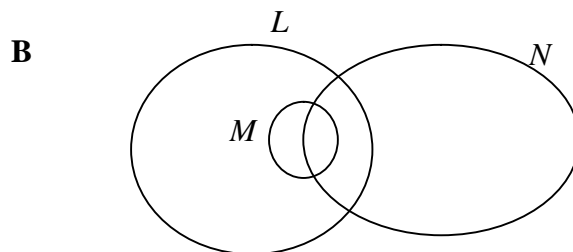
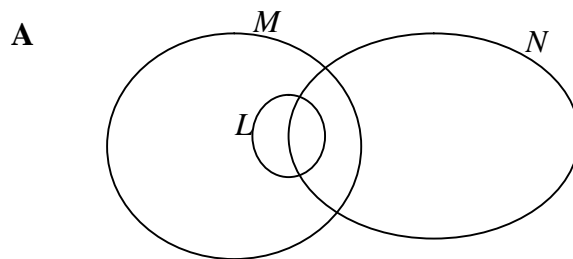
- 29** Given set $P = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ and set $Q = \{\text{prime numbers less than } 10\}$. Find $n(P \cap Q)'$.

Diberi bahawa set $P = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ dan set $Q = \{\text{nombor perdana kurang daripada } 10\}$. Carikan $n(P \cap Q)'$.

- A** 4
- B** 5
- C** 6
- D** 7

- 30** Given sets L, M and N where $L \cup M = L$ and $M \subset (L \cap N)$. Which of the following Venn diagrams represents the above conditions?

Diberi set A set M dan set N dengan keadaan $L \cup M = L$ dan $M \subset (L \cap N)$. Gambar rajah Venn manakah yang mewakili keadaan di atas?



- 31 Given the universal set, $\xi = P \cup Q$, $P = \{10, 11, 12\}$ and set $Q = \{10, 12, 14, 16\}$, find the value of $n(\xi)$.

Diberi set semesta $\xi = P \cup Q$, $P = \{10, 11, 12\}$ dan set $Q = \{10, 12, 14, 16\}$, carikan nilai $n(\xi)$.

- A 4
B 5
C 6
D 7

- 32 The gradient of the straight line $3x + 2y = 12$ is

Kecerunan bagi garis lurus $3x + 2y = 12$ ialah

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

- 33 In Diagram 14, the gradient of straight line PQ is $\frac{3}{4}$.

Dalam Rajah 14, kecerunan garis lurus PQ ialah $\frac{3}{4}$.

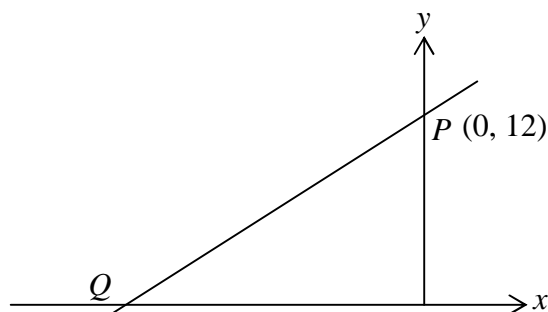


Diagram 14

Rajah 14

Determine the x – intercept of the straight line PQ .

Carikan pintasan x bagi garis lurus PQ .

- A - 16
B - 6
C - 12
D - 18

- 34 In class Cemerlang there are 8 school prefects and 24 students are not prefect. In February, another 4 new school prefects transfer to the class. A student is chosen from the class. What is the probability that the student chosen is a school prefect?
Di dalam kelas Cemerlang, 8 orang pelajar adalah pengawas sekolah dan 24 bukan pengawas. Pada bulan Februari, 4 orang pengawas lagi dipindahkan ke kelas tersebut. Seorang pelajar dipilih secara rawak dari kelas itu. Apakah kebarangkalian bahawa pelajar yang terpilih adalah pengawas?.

- A $\frac{1}{4}$
 B $\frac{1}{3}$
 C $\frac{2}{3}$
 D $\frac{3}{4}$

- 35 A box contains 24 blue marbles and several red marbles. The probability that chosen a red marbles is $\frac{1}{3}$. How many red marbles inside the box?
Sebuah kotak mengandungi 24 biji guli biru dan beberapa biji guli merah. Kebarangkalian guli berwarna merah dipilih ialah $\frac{1}{3}$. Hitungkan bilangan guli merah yang terdapat dalam kotak itu.

- A 6
 B 8
 C 12
 D 72

- 36 Table 1 shows some values of the variables M and N .
Jadual 1 menunjukkan sebahagian daripada nilai – nilai pembolehubah M dan N .

M	12	p
N	4	7

Table 1
Jadual 1

It is given that M varies directly as N . Calculate the value of p when $N = 7$
Diberi bahawa M berubah secara langsung dengan N . Hitungkan nilai p apabila $N = 7$

- A 21
 B 28
 C 48
 D 84

- 37 M varies inversely as square roots of L . Given that the constant is k , find the relation between M and L .
Diberi M berubah secara songsang dengan punca kuasa dua L . Diberi k ialah pemalar, cari hubungan antara M dan L .

A $M = kL^{\frac{1}{2}}$

B $M = \frac{k}{L^{\frac{1}{2}}}$

C $M = kL^2$

D $M = \frac{k}{L^2}$

- 38 Table 2 shows the relation between the variables R , Q and S is $R \propto Q^2S$
Jadual 2 menunjukkan hubungan antara tiga pembolehubah, R , Q dan S ialah $R \propto Q^2S$

R	8	12
Q	4	m
S	2	3

Table 2
 Jadual 2

Calculate the value of m .
Hitungkan nilai m .

- A 1
 B 4
 C 16
 D 32

$$39 \quad \begin{pmatrix} 5 & 3 \\ 2 & 1 \end{pmatrix} \begin{pmatrix} 2 & 1 \\ -3 & 0 \end{pmatrix} =$$

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

$$B \quad \begin{pmatrix} 1 & 5 \\ -7 & 2 \end{pmatrix}$$

$$C \quad \begin{pmatrix} 1 & 5 \\ 1 & 2 \end{pmatrix}$$

$$D \quad \begin{pmatrix} 10 & 3 \\ -6 & 0 \end{pmatrix}$$

$$40 \quad \text{Given that } \begin{pmatrix} 8 \\ 4 \end{pmatrix} - 2 \begin{pmatrix} 6 \\ 2n \end{pmatrix} = \begin{pmatrix} -4 \\ 4n \end{pmatrix}. \text{ Find the value of } n.$$

$$\text{Diberi bahawa } \begin{pmatrix} 8 \\ 4 \end{pmatrix} - 2 \begin{pmatrix} 6 \\ 2n \end{pmatrix} = \begin{pmatrix} -4 \\ 4n \end{pmatrix}. \text{ Cari nilai } n$$

$$A \quad \frac{1}{3}$$

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

$$C \quad \frac{3}{4}$$

$$D \quad \frac{4}{3}$$

END OF QUESTION PAPER