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1449/1
Matematik
Kertas 1
September
2009
1¼ jam

**PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA
NEGERI PERAK
2009**

MATEMATIK

KERTAS 1

Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

MAKLUMAT UNTUK CALON

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 2 hingga halaman 4.

Kertas soalan ini mengandungi 20 halaman bercetak.

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

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

RELATIONS / PERKAITAN

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

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

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

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

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

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

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

Jarak

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

Titik tengah

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

$$\text{Purata laju} = \frac{\text{jarak yang dilalui}}{\text{masa yang diambil}}$$

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

$$\text{Min} = \frac{\text{hasil tambah nilai data}}{\text{bilangan data}}$$

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

$$\text{Min} = \frac{\text{hasil tambah (nilai titik tengah kelas x kekerapan)}}{\text{hasil tambah kekerapan}}$$

$$12 \quad \text{Pythagoras Theorem} \quad c^2 = a^2 + b^2$$

$$\text{Teorem Pithagoras} \quad c^2 = a^2 + b^2$$

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

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

$$m = - \frac{\text{pintasan-y}}{\text{pintasan-x}}$$

**SHAPES AND SPACE
BENTUK DAN RUANG**

1. Area of trapezium = $\frac{1}{2}$ x sum of parallel sides x height
Luas trapezium = $\frac{1}{2}$ x hasil tambah dua sisi selari x tinggi

2. Circumference of circle = $\pi d = 2\pi r$
Lilitan bulatan = $\pi d = 2\pi r$

3. Area of circle = πr^2
Luas bulatan = πr^2

4. Curved surface area of cylinder = $2\pi rh$
Luas permukaan melengkung silinder = $2\pi rt$

5. Surface area of sphere = $4\pi r^2$
Luas permukaan sfera = $4\pi r^2$

6. Volume of right prism = cross sectional area x length
Isipadu prisma tegak = luas keratan rentas x panjang

7. Volume of cylinder = $\pi r^2 h$
Isipadu silinder = $\pi r^2 t$

8. Volume of cone = $\frac{1}{3} \pi r^2 h$
Isipadu kon = $\frac{1}{3} \pi r^2 t$

9. Volume of sphere = $\frac{4}{3} \pi r^3$
Isipadu sfera = $\frac{4}{3} \pi r^3$

10. Volume of right pyramid = $\frac{1}{3}$ x base area x height
Isipadu piramid tegak = $\frac{1}{3}$ x luas tapak x tinggi

11. Sum of interior angles of a polygon = $(n-2) \times 180^\circ$
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 Round off 17 083 correct to three significant figures.
Bundarkan 17 083 betul kepada tiga angka bererti.
- A 17 000
B 17 080
C 17 090
D 17 100
- 2 Express 4 730 000 in standard form.
Ungkapkan 4 730 000 dalam bentuk piawai.
- A 4.73×10^6
B 4.73×10^4
C 4.73×10^{-4}
D 4.73×10^{-6}
- 3 $0.000087 - 6.4 \times 10^{-6}$
- A 1.3×10^{-7}
B 1.3×10^{-6}
C 8.06×10^{-5}
D 8.06×10^{-6}
- 4 The area of a rectangular house plot is 6.8 km^2 . Its width is 2 500 m. The length in m, of the house plot is
Luas tapak rumah yang berbentuk segi empat tepat ialah 6.8 km^2 . Lebar tapak rumah itu ialah 2 500 m. Panjang, dalam m, tapak rumah ialah
- A 2.72×10^3
B 2.72×10^4
C 4.3×10^3
D 4.3×10^4
- 5 What is the value of the digit 3, in base ten, in the number 2361_8 ?
Apakah nilai bagi digit 3, dalam asas sepuluh, dalam nombor 2361_8 ?
- A 75
B 101
C 192
D 300
- 6 $110111_2 + 11101_2 =$
- A 1101000_2
B 1010100_2
C 1110001_2
D 1011000_2

Dapatkan skema Jawapan di Laman

- 7 In Diagram 1, PQRSTU is a regular hexagon and RSV is a straight line.
 Dalam Rajah 1, PQRSTU ialah sebuah heksagon sekata dan RSV ialah garis lurus.

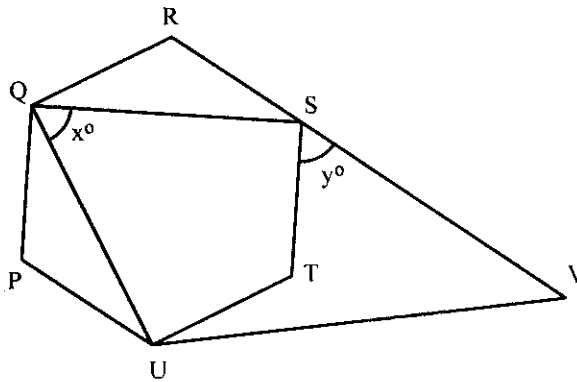


Diagram 1

Find the value of $x + y$

Carikan nilai $x + y$

- A 100°
 B 120°
 C 150°
 D 160°
- 8 In Diagram 2, PQR is a tangent to the circle center O.
 Dalam Rajah 2, PQR ialah tangen kepada bulatan berpusat O.

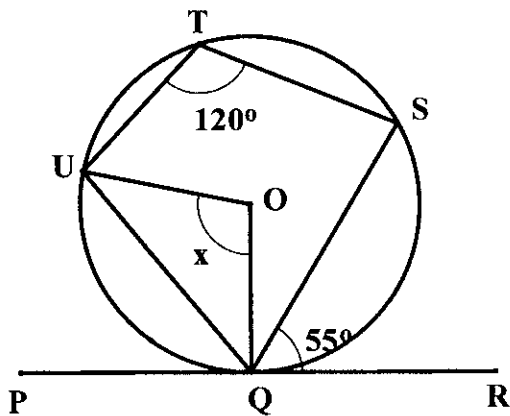


Diagram 2

Find the value of x

Carikan nilai x

- A 55°
 B 60°
 C 105°
 D 130°

Dapatkan skema Jawapan di Laman

- 9 Diagram 3 shows points plotted on a Cartesian plane.
Rajah 3 menunjukkan beberapa titik pada sebuah satah Cartesian.

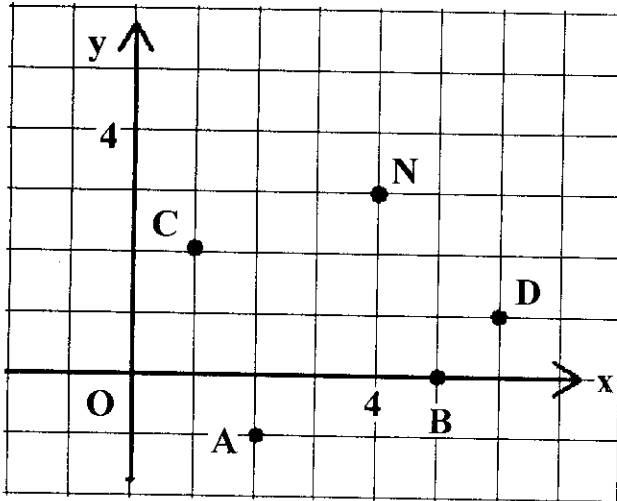


Diagram 3

Which of the point A, B, C or D, is the image of point N under a clockwise rotation of 90° about the center (3, 1)?

Antara titik A, B, C atau D, yang manakah imej bagi titik N di bawah putaran 90° ikut arah jam pada pusat (3, 1)?

- 10 In Diagram 4, PQR is the image of LMN under an enlargement
Dalam Rajah 4, PQR ialah imej kepada LMN di bawah satu pembesaran.

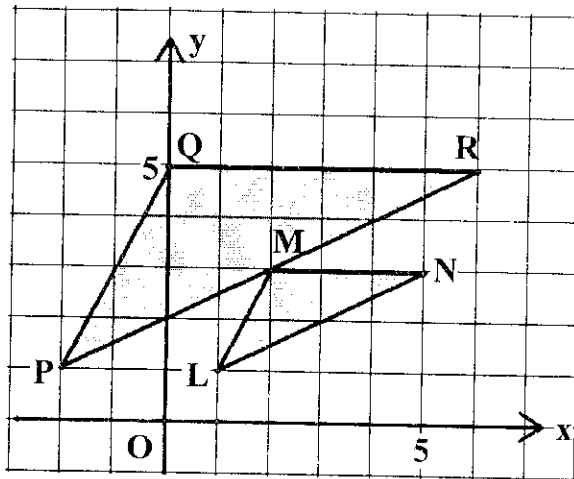


Diagram 4

The centre of the enlargement and its scale factor are
Pusat pembesaran dan faktor skala ialah

	Centre of enlargement <i>Pusat Pembesaran</i>	Scale factor <i>Faktor skala</i>
A	(4, 1)	3
B	(4, 1)	2
C	(1, 4)	3
D	(1, 4)	2

Dapatkan skema Jawapan di Laman

- 11 It is given that $\cos \theta = -0.2578$ and $180^\circ \leq \theta \leq 360^\circ$. Find the value of θ
 Diberi bahawa $\cos \theta = -0.2578$ dan $180^\circ \leq \theta \leq 360^\circ$. Carikan nilai θ
- A $194^\circ 56'$
 B $255^\circ 4'$
 C $224^\circ 56'$
 D $345^\circ 4'$
- 12 In Diagram 5, S is the midpoint of the straight line QST.
 Dalam Rajah 5, S ialah titik tengah bagi garis lurus QST.

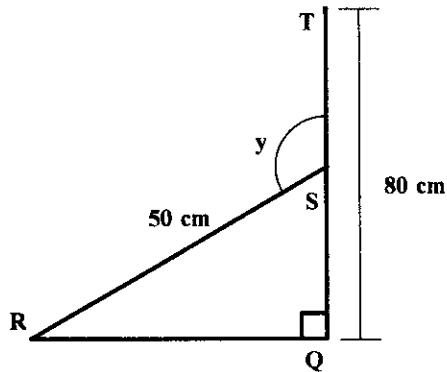


Diagram 5

The value of $\tan y$ is
 Nilai $\tan y$ ialah

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

- 13 Diagram 6 shows the graph of $y = \sin 2x$
Rajah 6 menunjukkan graf $y = \sin 2x$.

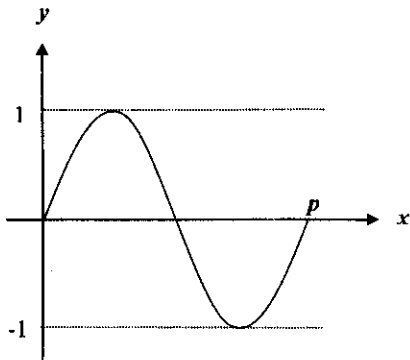


Diagram 6

The value of p is
Nilai p ialah

- A 90°
 - B 180°
 - C 270°
 - D 360°
- 14 Diagram 7 shows a cuboid with a horizontal base TUVW.
Rajah 7 menunjukkan sebuah kuboid dengan tapak mengufuk TUVW.

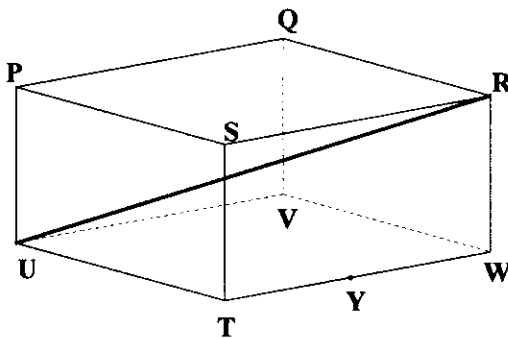


Diagram 7

Name the angle between the line RU and the base TUVW.
Namakan sudut di antara garis RU dengan tapak TUVW.

- A $\angle RUV$
- B $\angle RUT$
- C $\angle RUW$
- D $\angle RUY$

Dapatkan skema Jawapan di Laman

- 15 In Diagram 8, RQ and MNP are two vertical poles on a horizontal plane.
 Dalam Rajah 8, RQ dan MNP ialah dua batang tiang tegak pada satah mengufuk.

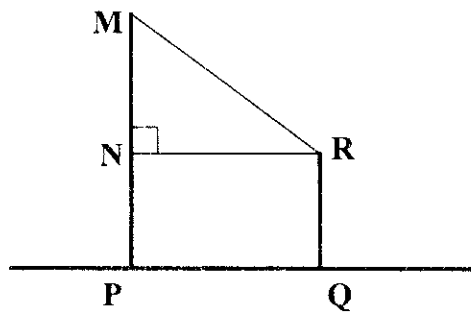


Diagram 8

The angle of elevation of point M from point Q is
 Sudut dongakan titik M dari titik Q ialah

- A $\angle MQR$
 B $\angle MQN$
 C $\angle MQP$
 D $\angle NQP$
- 16 In diagram 9, MN and PQ are two vertical poles on a horizontal plane.
 Dalam rajah 9, MN dan PQ ialah dua batang tiang tegak pada satah mengufuk.

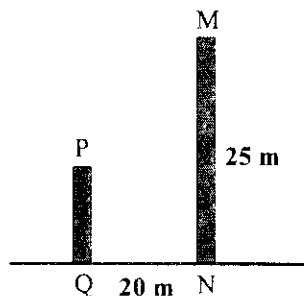


Diagram 9

The angle of depression of peak P from peak M is 34° . Calculate the height, in m, of the pole PQ.
 Sudut tunduk puncak P dari puncak M ialah 34° . Hitungkan tinggi, dalam m, tiang PQ.

- A 4.65
 B 8.42
 C 11.51
 D 13.82

- 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

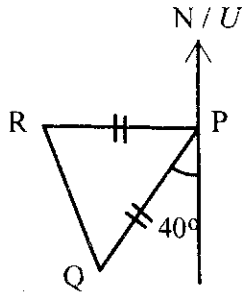


Diagram 10

Given that the bearing of R from P is 260° , find the bearing of Q from R.
Diberi bearing R dari P ialah 260° , cari bearing Q dari R

- A 140°
 - B 150°
 - C 290°
 - D 330°
- 18 Diagram 11 shows the position of five towns A, B, C, D and X on the surface of the earth.
Rajah 11 menunjukkan kedudukan lima buah bandar A, B, C, D dan X pada permukaan bumi.

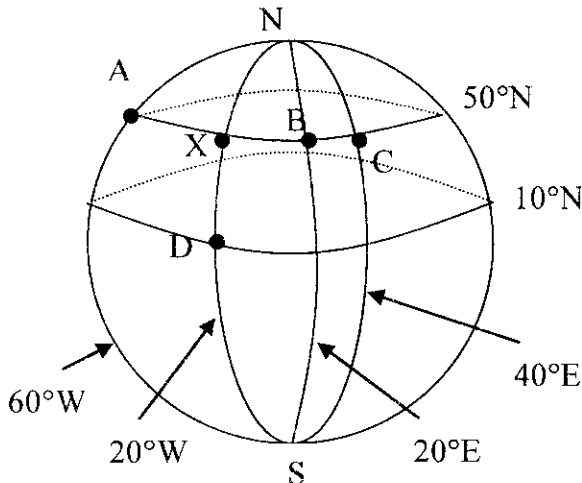


Diagram 11

Which of the towns A, B, C and D is located due east of X with difference in longitude of 40° ?
Antara bandar A, B, C dan D yang manakah berada di Timur X dengan beza longitud 40° ?

- 19 $(2x - y)^2 - x(x - y) =$
- A $3x^2 - 3xy + y^2$
 - B $3x^2 - 5xy + y^2$
 - C $3x^2 + xy - y^2$
 - D $3x^2 - 5xy - y^2$

Dapatkan skema Jawapan di Laman

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

Ungkapkan $\frac{p-3}{p^2} - \frac{p+2}{p}$ sebagai satu pecahan tunggal dalam bentuk termudah.

A $\frac{-3-p-p^2}{p}$

B $\frac{-3-p-p^2}{p^2}$

C $\frac{-3+p-p^2}{p}$

D $\frac{-3+p-p^2}{p^2}$

21 Given that $\frac{y}{3} = \frac{4y-1}{\sqrt{w}}$, express w in terms of y

Diberi $\frac{y}{3} = \frac{4y-1}{\sqrt{w}}$, ungkapkan w dalam sebutan y

A $w = \frac{3(4y-1)^2}{y}$

B $w = \frac{3(4y^2-1)^2}{y^2}$

C $w = 9\left(\frac{4y-1}{y}\right)^2$

D $w = \left(\frac{36y-1}{y}\right)^2$

22 Given that $3^x = \frac{9}{3^{2x}}$, find the value of x .

Diberi $3^x = \frac{9}{3^{2x}}$, cari nilai x

A 2

B 1

C $\frac{2}{3}$

D $\frac{1}{2}$

23 Simplify $\left(\frac{9^2 \times 5^{\frac{1}{3}}}{15^2}\right)^3$

Ringkaskan $\left(\frac{9^2 \times 5^{\frac{1}{3}}}{15^2}\right)^3$

A $3^2 \times 5^{-3}$

B $3^4 \times 5^{-4}$

C $3^6 \times 5^{-5}$

D $3^{10} \times 5^{-1}$

24 The solution for $4x + 5 < 1 - \frac{2x}{3}$ is

Penyelesaian bagi $4x + 5 < 1 - \frac{2x}{3}$ ialah

A $x < -\frac{7}{3}$

B $x < -\frac{6}{7}$

C $x > -\frac{6}{7}$

D $x > -\frac{2}{7}$

Dapatkan skema Jawapan di Laman

25 Solve $\frac{1}{3}(1 - 2k) + 3 = 2(k - 1)$

Selesaikan $\frac{1}{3}(1 - 2k) + 3 = 2(k - 1)$

- A -2
- B -4
- C 2
- D 4

- 26 Diagram 12 is a bar chart which is incomplete, showing the number of fruit trees in an orchard.
Rajah 12 ialah carta bar yang tidak lengkap menunjukkan bilangan pokok buah di sebuah dusun

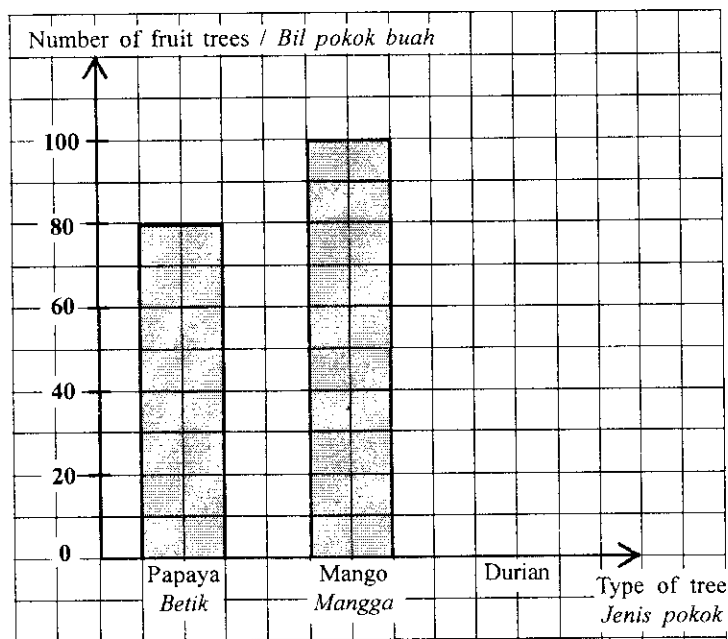


Diagram 12

The ratio of the number of Mango trees to the number of Durian trees is 5 : 3.
Find the total number of fruit trees in the orchard.

Nisbah bilangan pokok Mangga kepada pokok Durian ialah 5 : 3.

Cari jumlah pokok buah di dusun tersebut

- A 240
- B 280
- C 300
- D 320

Dapatkan skema Jawapan di Laman

- 27 Table 1 shows a set of six pieces of data where x represents an integer
Jadual 1 menunjukkan set data di mana x mewakili integer

5, x , x , 12, 10, 15

Table 1

The mean for the data is 9. Calculate the difference between the mode and the median
Min bagi data tersebut ialah 9. Hitungkan perbezaan di antara mod dan median.

- A 2
 B 4
 C 6
 D 8
- 28 Diagram 13 shows graph of a function.
Rajah 13 menunjukkan graf fungsi.

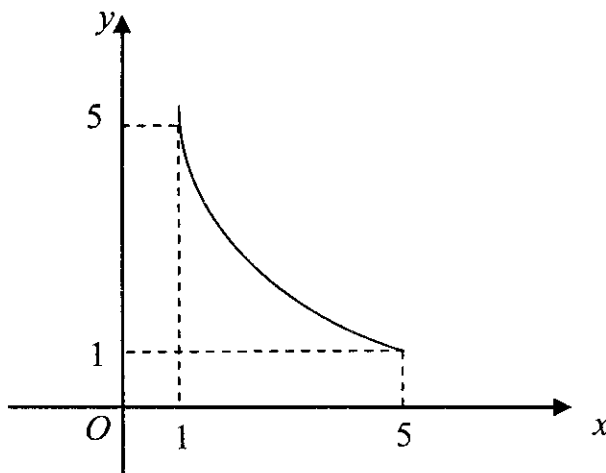


Diagram 13

The equation of the function is
Persamaan bagi fungsi tersebut ialah

- A $y = -\frac{5}{x}$
 B $y = -\frac{x^2}{5}$
 C $y = \frac{5}{x}$
 D $y = \frac{x^2}{5}$

Dapatkan skema Jawapan di Laman

- 29 Given $\xi = \{a, b, c, d, e, i, o, u\}$, $X = \{a, i, u\}$, $Y = \{a, b, d\}$ and $Z = \{b, c, d\}$.
 Diberi $\xi = \{a, b, c, d, e, i, o, u\}$, $X = \{a, i, u\}$, $Y = \{a, b, d\}$ dan $Z = \{b, c, d\}$.

Find $n[(X' \cap Y) \cup Z]$

Cari $n[(X' \cap Y) \cup Z]$

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

- 30 Diagram 14 is a Venn diagram, which shows sets J , K and M . The universal set $\xi = J \cup K \cup M$.
 Rajah 14 ialah gambar rajah Venn yang menunjukkan set J , K dan M . Set semesta ialah $\xi = J \cup K \cup M$.

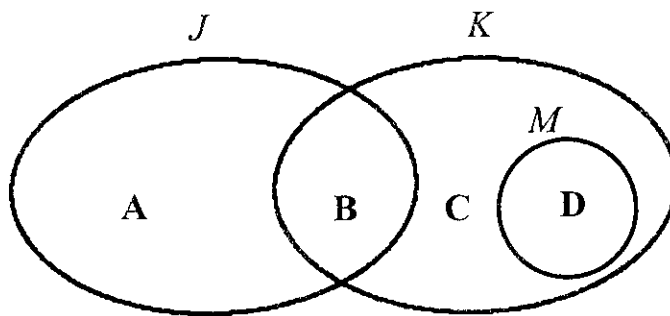


Diagram 14

Which of the region, **A**, **B**, **C**, or **D** represents the set $(J \cap K)' \cap M$?

Antara rantau **A**, **B**, **C** atau **D** yang mana mewakili set $(J \cap K)' \cap M$?

- 31 Given a universal set, $\xi = \{x : x \text{ is an integer, } 16 \leq x \leq 28\}$ and
 $T = \{x : x \text{ are numbers where the sum of its digits is less than } 5\}$.
 Diberi set semesta, $\xi = \{x : x \text{ ialah integer, } 16 \leq x \leq 28\}$ dan
 $T = \{x : x \text{ adalah nombor dimana hasil tambah digitnya kurang dari } 5\}$.

Find $n(T')$

Cari $n(T')$

- A 3
- B 7
- C 10
- D 11

Dapatkan skema Jawapan di Laman

32 In Diagram 15, the gradient of the straight line $TV = -\frac{3}{4}$

Dalam Rajah 15, kecerunan garis lurus $TV = -\frac{3}{4}$

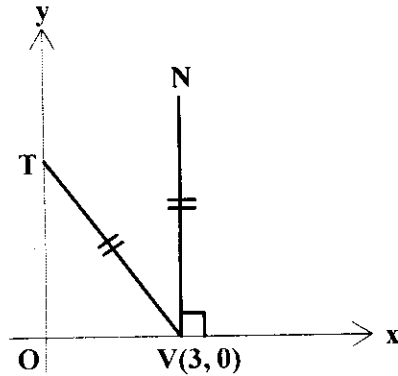


Diagram 15

Find the coordinates of point N .

Cari koordinat bagi titik N .

- A (4, 3)
- B (3, 4)
- C (3, 5)
- D (4, 5)

33 Find the y -intercept of the straight line $6x - 5y = 10$

Cari pintasan- y bagi garis lurus $6x - 5y = 10$

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

34 The customers of a certain shop consist of 32 adults and a few children. If a customer is chosen at random from the shop, the probability that the customer is a child is $\frac{3}{7}$.

Pelanggan di sebuah kedai terdiri daripada 32 orang dewasa dan sebilangan kanak-kanak. Jika seorang pelanggan dipilih secara rawak daripada kedai itu, kebarangkalian pelanggan itu kanak-kanak ialah $\frac{3}{7}$.

Calculate the number of children among the customers of the shop.

Hitungkan bilangan pelanggan kanak-kanak di kedai itu.

- A 24
- B 30
- C 54
- D 60

- 35 A bag contains 3 black cards, 7 red cards and 5 blue cards. A card is picked at random from the bag. State the probability of getting a card that is not black.

Sebuah beg mengandungi 3 keping kad hitam, 7 keping kad merah dan 5 keping kad biru. Sekeping kad diambil secara rawak dari beg. Nyatakan kebarangkalian mendapatkan kad bukan berwarna hitam.

- A $\frac{1}{5}$
B $\frac{1}{3}$
C $\frac{7}{15}$
D $\frac{4}{5}$

- 36 F varies directly as the square root of m and inversely as the square of n . Given that $F = \frac{4}{5}$

when $m = 64$ and $n = 5$, express F in terms of m and n .

F berubah secara langsung dengan punca kuasa dua m dan secara songsang dengan kuasa dua n . Diberi $F = \frac{4}{5}$ apabila $m = 64$ dan $n = 5$, ungkapkan F dalam sebutan m dan n .

- A $F = \frac{3\sqrt{m}}{2n^2}$
B $F = \frac{5\sqrt{m}}{2n^2}$
C $F = \frac{2n^2}{3\sqrt{m}}$
D $F = \frac{3n^2}{4\sqrt{m}}$

- 37 It is given that $w \propto \frac{1}{n^3}$ and $w = 5$ when $n = 2$. Calculate the value of n when $w = \frac{5}{8}$

Diberi bahawa $w \propto \frac{1}{n^3}$ dan $w = 5$ apabila $n = 2$. Hitungkan nilai bagi n apabila $w = \frac{5}{8}$

- A 4
B 16
C 24
D 64

- 38 Table 2 shows some values of P , Q , and R .
Jadual 2 menunjukkan nilai bagi P , Q dan R .

P	$\frac{2}{3}$	$\frac{1}{5}$
Q	2	4
R	9	m

Table 2

Given that $P \propto \frac{1}{Q\sqrt{R}}$, calculate the value of m .

Diberi $P \propto \frac{1}{Q\sqrt{R}}$, hitungkan nilai bagi m

- A 5
- B 15
- C 18
- D 25

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

A $\begin{pmatrix} -3 & -6 \\ -6 & 5 \end{pmatrix}$

C $\begin{pmatrix} 7 & -2 \\ -3 & 3 \end{pmatrix}$

B $\begin{pmatrix} -4 & -2 \\ -6 & 2 \end{pmatrix}$

D $\begin{pmatrix} -3 & -2 \\ -6 & 3 \end{pmatrix}$

40 Given that $\begin{pmatrix} -4 \\ 2x \end{pmatrix} (y \ 5) = \begin{pmatrix} 20 & -20 \\ 30 & -30 \end{pmatrix}$, calculate the value of x and y .

Diberi $\begin{pmatrix} -4 \\ 2x \end{pmatrix} (y \ 5) = \begin{pmatrix} 20 & -20 \\ 30 & -30 \end{pmatrix}$, hitungkan nilai bagi x dan y

A $x = -3, y = -5$

B $x = -6, y = -5$

C $x = 3, y = 5$

D $x = 5, y = 3$

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 done. 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 dilukis mengikut skala kecuali dinyatakan.
7. A list of formulae is provided on pages 2 to 4.
Satu senarai rumus disediakan di halaman 2 hingga halaman 4.
8. A booklet of four-figure mathematical tables is provided.
Sebuah buku sifir matematik empat angka disediakan.
9. You may use a non-programmable scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.