1449/1
MATHEMATICS
Kertas 1
Masa:
1¼ jam

PEPERIKSAAN PERCUBAAN SPM 2009

MATHEMATICS P1
Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

Kertas soalan ini adalah dalam dwibahasa. Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalambahasa Melayu.

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of 40 questions.
   Kertas ini mengandungi 40 soalan
2. Answer **all** questions.
   Jawab semua soalan
3. Answer each question by blackening the correct space on the objective answer sheet.
   Jawab setiap soalan dengan menghitamkan ruangan yang betul pada kertas jawapan objektif
4. Blacken only **one** space for each question
   Hitamkan **satu** ruangan sahaja bagi setiap soalan.
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 menukar 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 page 2 to 4
   Satu senarai rumus disediakandi halaman 2 hingga 4.
8. You may use a non-programmable scientific calculator.
   Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan

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 . $a^m \times a^n = a^{m+n}$	

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

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

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

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

5 Distance / *Jarak*

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

6 Midpoint / *Titik tengah*

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

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

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

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

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

10 Pythagoras Theorem

Teorem Pithagoras

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

11 $P(A) = \frac{n(A)}{n(S)}$

12 $P(A') = 1 - P(A)$

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

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

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

9 Mean $= \dfrac{\text{sum of (classmark} \times \text{frequency)}}{\text{sum of frequencies}}$

Min $= \dfrac{\textit{hasil tambah (nilai titik tengah kelas} \times \textit{kekerapan}}{\textit{hasil tambah kekerapan}}$

SHAPES AND SPACE
BENTUK DAN RUANG

1 Area of trapezium $= \frac{1}{2} \times$ sum of parallel sides $\times$ height

Luas trapezium $= \frac{1}{2} \times$ *hasil tambah dua sisi selari* $\times$ *tinggi*

2 Circumference of circle $= \pi d = 2 \pi r$

Lilitan bulatan $= \pi d = 2 \pi j$

3 Area of circle $= \pi r^2$

Luas bulatan $= \pi j^2$

4 Curved surface area of cylinder $= 2 \pi rh$

Luas permukaan melengkung silinder $= 2 \pi jt$

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 kon $= \frac{1}{3} \pi j^2 t$

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

Isipadu silinder $= \pi j^2 t$

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

Isipadu sfera $= \frac{4}{3} \pi j^3$

10 Volume of right pyramid $= \frac{1}{3} \times$ base area $\times$ height

Isipadu pyramid tegak $= \frac{1}{3} \times$ *luas tapak* $\times$ *tinggi*

11 Sum of interior angles of a polygon
Hasil tambah sudut pedalaman poligon
$= (n - 2) \times 180^o$

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

$$\frac{\textit{panjang lengkuk}}{\textit{lilitan bulatan}} = \frac{\textit{sudut pusat}}{360^o}$$

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

$$\frac{\textit{luas sektor}}{\textit{luas bulatan}} = \frac{\textit{sudut pusat}}{360^o}$$

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 0.0575 correct to two significant figures.
Bundarkan 0.0575 betul kepada dua angka bererti.

A. 0.05
B. 0.06
C. 0.058
D. 0.057

2. $5.4 \times 10^{8} + 2.9 \times 10^{9} =$

A 3.44×10^{8}
B 3.44×10^{9}
C 8.3×10^{9}
D 8.3×10^{8}

3. $\dfrac{42\,000}{7 \times 10^{-6}} =$

A 6×10^{9}
B 6×10^{10}
C 6×10^{-9}
D 6×10^{-10}

4. The area of a rectangular nursery plot is 1.28 km^2 . Its width is 320 m.
The length, in m , of the nursery plot is
Luas tapak semaian yang berbentuk segiempat tepat ialah 1.28 km^2 .
Lebar tapak semaian itu ialah 320 m. Panjang, dalam m , tapak semaian itu
A 4×10^{2}
B 4×10^{3}
C 6.4×10^{3}
D 6.4×10^{4}

5. Express $6(8^4) + 5(8^3) + 8$ as a number in base eight.
Ungkapkan $6(8^4) + 5(8^3) + 8$ sebagai nombor dalam asas lapan.
A. 6510_8
B. 65100_8
C. 65010_8
D. 43010_8

6. $11110_2 + 111_2 =$

A 100101_2
B 110101_2
C 101111_2
D 111000_2

7. Diagram 1 shows a square KLMN and an equilateral triangle KNT.
Rajah 1 menunjukkan segiempat sama KLMN dan segitiga sama sisi KNT.

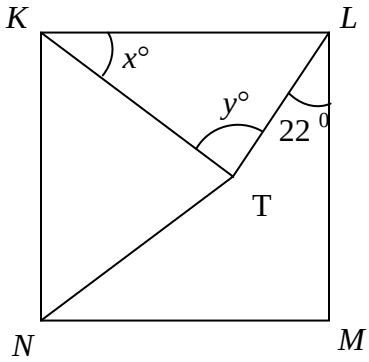


Diagram 1
Rajah 1

Find the value of $y - x$
Cari nilai bagi $y - x$ *.*

A 42
B 52
C 98
D 112

8. In diagram 2, KLM is a tangent to the circle with centre O, at L.
Dalam Rajah 2, KLM ialah tangen kepada bulatan berpusat O di L.

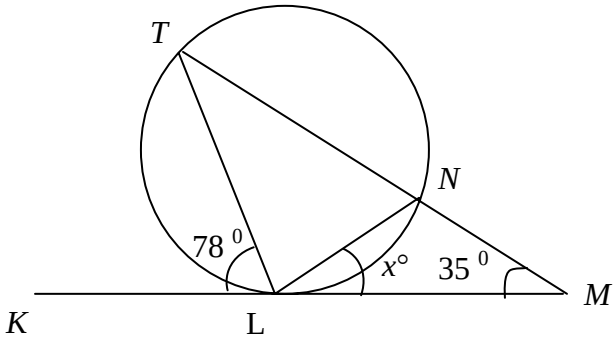


Diagram 2
Rajah 2

TNM is a straight line, find the value of x.
TNM ialah garis lurus, cari nilai x.

A 35^0
B 43^0
C 98^0
D 113^0

9. The point (6, 7) is the image of the point (6,-3) under a reflection in the line y = k . Find the value of k .
Titik (6,7) adalah imej kepada titik (6,-3) dibawah pantulan pada garis y = k . Cari nilai k.

A 1
B 2
C 3
D 4

10.

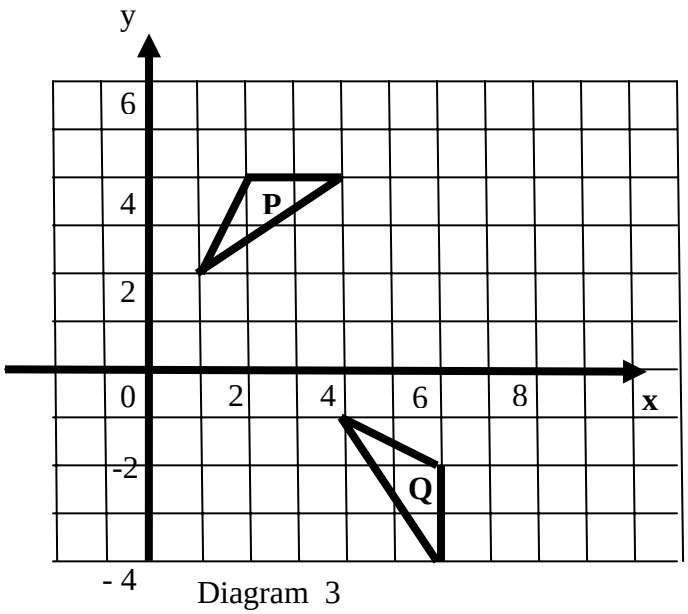


Diagram 3
Rajah 3

In diagram 3, Q is the image of P under a clockwise rotation 90^0.
Find the coordinates of the centre of rotation.

Dalam rajah 3, Q is imej kepada P dibawah putaran 90^0 ikut arah jam .
Cari koordinat bagi pusat putaran.

A (0,0)

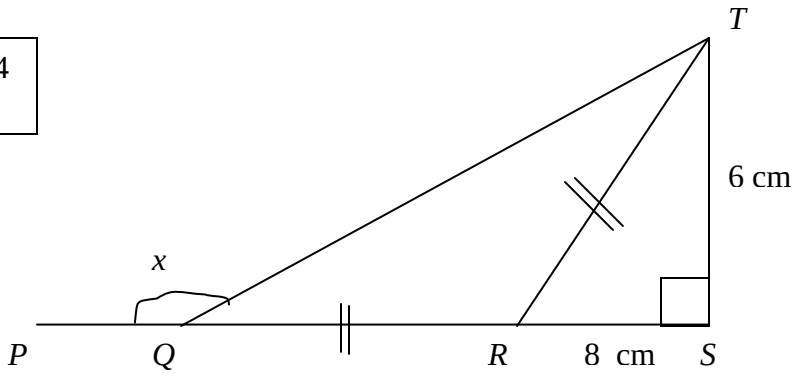
B (0, -1)

C (1,0)

D (1,- 1)

11. Diagram 4 shows a right-angled triangle QST.
PQRST is a straight line .
Rajah 4 menunjukkan sebuah segitiga bersudut tegak QST.
PQRS ialah garis lurus .

Diagram 4
Rajah 4



Given QR = RT , find the value of tan x^0 .
Diberi QR = RT , cari nilai tan x^0 .

A $\frac{3}{4}$ B $\frac{1}{2}$ C $-\frac{1}{3}$ D $-\frac{3}{5}$

12. Diagram 5 shows the graph of y = cos x. Find the value of k.
Rajah 5 menunjukkan graf y = cos x. Cari nilai k.

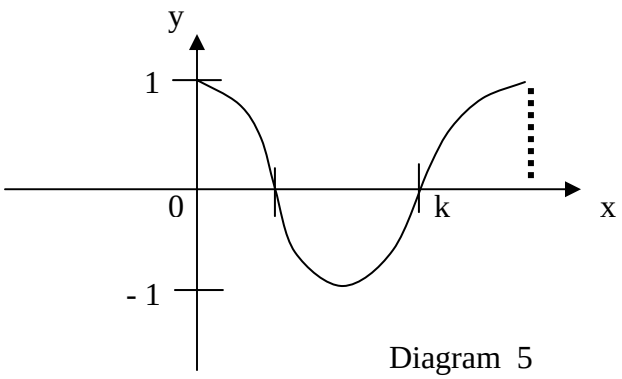
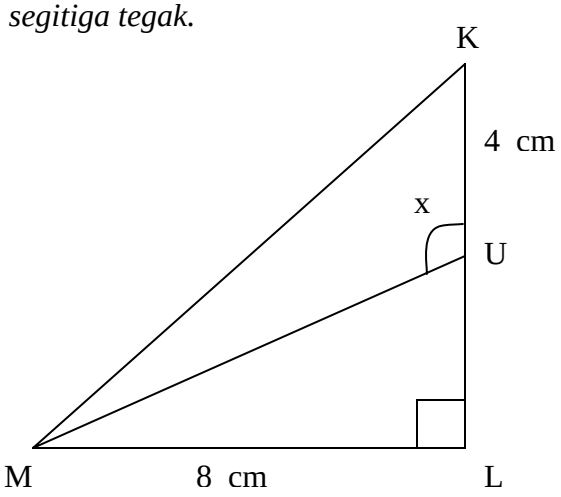


Diagram 5
Rajah 5

A 0^0
B 90^0
C 180^0
D 270^0

13. In diagram 6, KLM is a right-angled triangle.
Dalam rajah 6 , KLM ialah segitiga tegak.

Diagram 6
Rajah 6



Given that KUL is a straight line and tan $\angle$ MKL = $\frac{4}{5}$, find the value of cos x .

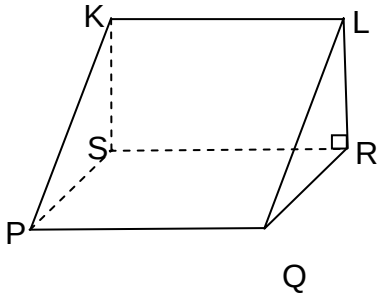
Diberi bahawa KUL ialah garis lurus dan tan $\angle$ MKL = $\frac{4}{5}$, cari nilai cos x .

A . $-\frac{4}{3}$ B. $-\frac{3}{5}$ C. $-\frac{4}{5}$ D. $-\frac{3}{4}$

14. Diagram 7 shows a right-angled triangular prism with the horizontal base PQRS.

Rajah 7 menunjukkan sebuah prisma segitiga tegak dengan tapak mengufuk PQRS.

Diagram 7
Rajah 7



What is the angle between the line KQ and the base PQRS.
Apakah sudut di antara garis KQ dengan tapak PQRS.

A. $\angle$KQP

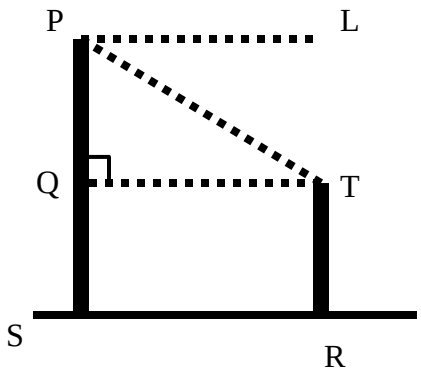
B. $\angle$ KQS

C. $\angle$ KQR

D. $\angle$KRQ

15.

Diagram 8
Rajah 8



In diagram 8, PQR and ST are two vertical poles on a horizontal plane. Name the angle of elevation of point P from point T.

Dalam rajah 8 , PQR dan ST menunjukkan dua tiang tegak pada satah mengufuk. Namakan sudut dongak titik P dari titik T.

A ∠ TPL
B ∠ RPT
C ∠ RTP
D ∠ QTP

16. In diagram 9, EF is a vertical flag pole. FG is horizontal.

Dalam rajah 9, EF ialah sebatang tiang bendera tegak. FG adalah mengufuk.

The angle of elevation of E from G is 32^0. The height, in m, of the flag pole is

Sudut dongakan E dari F ialah 32^0. Tinggi, dalam m, tiang bendera itu ialah

A 31.27
B 36.87
C 50.03
D 94.42

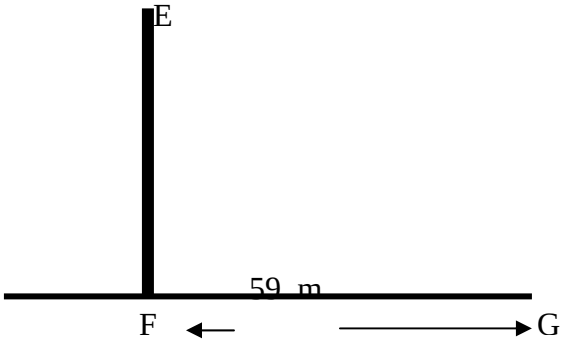


Diagram 9
Rajah 9

17. In diagram 10, KOL is the diameter of the earth.
State the position of L.

Dalam r*ajah 10 , KOL ialah diameter bumi.*
Nyatakan kedudukan titik L.

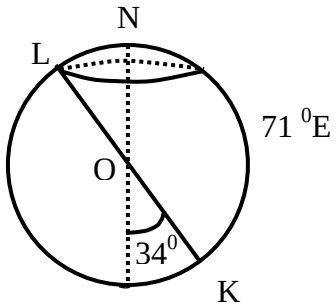


Diagram 10
Rajah 10

A (34 ^{0} N, 71 ^{0} W)

B (34 ^{0} N, 109 ^{0} W)

C (56 ^{0} N , 109 ^{0} W)

D (56 ^{0} N , 71 ^{0} W)

18. E (40 ^{0}N, 120 ^{0} W) and F are two points on the earth`s surface. If F is 4500 nautical miles due south of E, find the latitude of F.

E (40^{0}N, 120^{0}W) dan F ialah dua titik di permukaan bumi. Jika F terletak 4500 batu nautika ke selatan E, cari latitud F .

A 10 ^{0} S
B 25 ^{0} S
C 35 ^{0} S
D 65 ^{0} S

19. Diagram 11 shows three point P,Q and R on a horizontal plane.
Q is lies to the north of R.
Rajah 11 menunjukkan tiga titik P,Q dan R pada satah mengufuk.

It is given that Q is due north of R.
Find the bearing of P from R.
Diberi Q berada ke utara R.
Cari bearing P dari R.

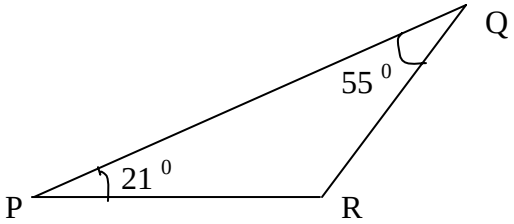


Diagram 11
Rajah 11

A 082 ^{0}
B 098 ^{0}
C 117 ^{0}
D 256 ^{0}

20. $(2x-3)^2 - 4x(x-4) =$

A $4x^2 + 4x + 9$
B $8x^2 - 28x - 9$
C $4x + 9$
D $9 - 28x$

21 Given that $4m - 8 = 15 - (3 + m)$, then m =
Diberi $4m - 8 = 15 - (3 + m)$, maka m =

A. 4

B. 10

C. 18

D. 20

22. Express $\frac{m+3}{3m} - \frac{n-m}{mn}$ as a single fraction in its simplest form.

Ungkapkan sebagai $\frac{m+3}{3m} - \frac{n-m}{mn}$ satu pecahan tunggal dalam bentuk termudah.

A $\frac{n+3}{3n}$ B $\frac{n-3}{3n}$ C $\frac{n+3}{3mn}$ D $\frac{3-n}{3mn}$

23. Given that $\frac{5T - \sqrt{H}}{6} = 4$, express H in terms of T.

Diberi bahawa $\frac{5T - \sqrt{H}}{6} = 4$, ungkapkan H dalam sebutan T.

A $(5T - 24)^2$

B $25T + 24$

C $25T^2 - 24$

D $\left(\frac{5}{6}T\right)^2 + 4$

24. Simplify:
Ringkaskan:

$$\frac{(m^{3}n^{5})^{2}}{n^{10}}$$

A $m^{6}n^{10}$

B $m^{5}n^{-3}$

C $m^{6}n$

D m^{6}

25. Given that $25^{x} = 5^{8+x}$, find the value of x
Diberi $25^{x} = 5^{8+x}$, *carikan nilai x.*

A. 1

B. 2

C. 4

D. 8

26 List all the integers x that satisfy both the inequalities $x - 1 < 5$ and $x - \frac{3}{4} \geq 2$.
Senaraikan semua integer yang memuaskan kedua-dua ketaksamaan $x - 1 < 5$ *dan* $x - \frac{3}{4} \geq 2$.

A. 2, 3

B. 4 , 5

C. 3, 4, 5

D. 3, 4 , 5 , 6

27 Solve the simultaneous inequalities $\frac{1}{2}x < 3$ and $6 - 2x \leq 10$
Selesaikan ketaksamaan linear $\frac{1}{2}x < 3$ dan $6 - 2x \leq 10$

A $-2 < x \leq 6$

B $-2 \leq x < 6$

C $-6 < x \leq 2$

D $-6 \leq x < 2$

28. Diagram 12 is a bar chart showing the number of medals obtained by a school in a sports championship in the year 2008.
Rajah 12 ialah carta palang yang menunjukkan bilangan pingat yang dimenangi oleh sebuah sekolah dalam kejohanan sukan pada tahun 2008.

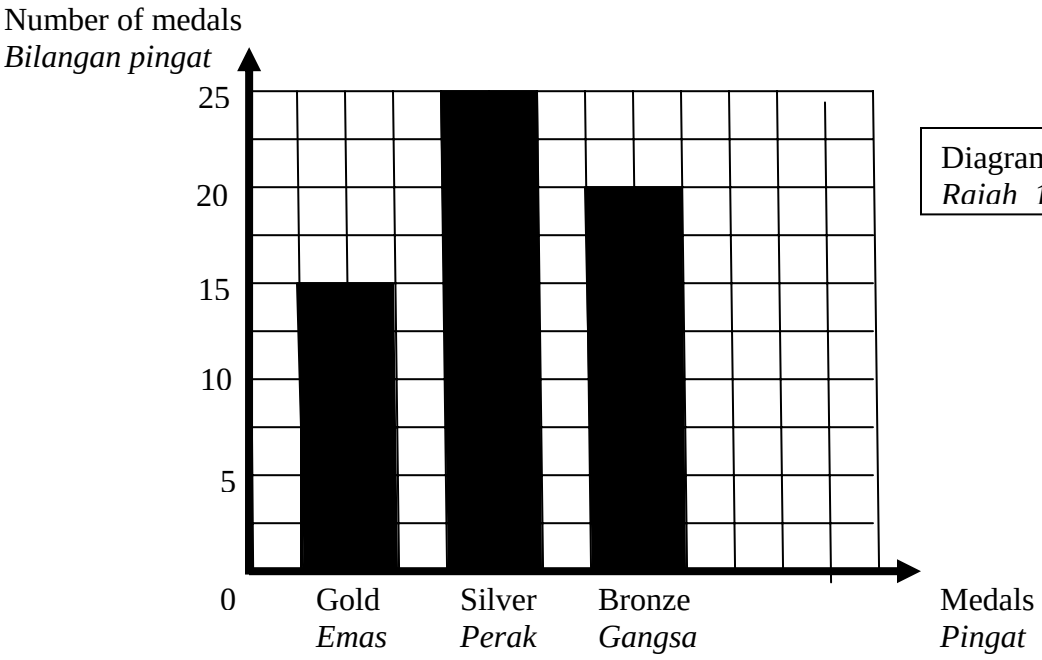


Diagram 12
Rajah 12

If a pie chart is drawn to represent the given information,calculate the difference of the angle sector which represent the gold and bronze medals.
Jika satu carta pai dilukis untuk mewakili maklumat yang diberi, hitung beza sudut sektor yang mewakili bilangan pingat emas dan pingat gangsa.

A 5 B 20 C 30 D 60

29. Diagram 13 is a pie chart which shows the combined results of a test taken by two groups of students. Table 1 shows the results of the groups, but is incomplete.

Rajah 13 ialah carta pai yang menunjukkan gabungan keputusan suatu ujian bagi dua kumpulan murid. Jadual 1 menunjukkan keputusan ujian itu mengikut kumpulan, tetapi belum dilengkapkan.

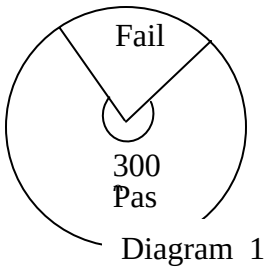


Diagram 13
Rajah 13

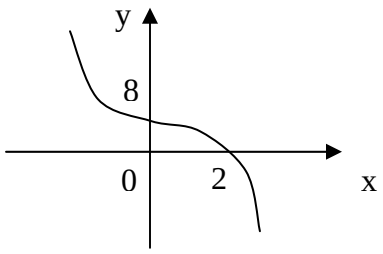
Group *Kumpulan*	Results *Keputusan*	
	Number of Passes *Bilangan Lulus*	Number of Failures *Bilangan Gagal*
Jujur	180	50
Dedikasi		
TOTAL *JUMLAH*	400	

Calculate the number of students in the Dedikasi Group.
Hitungkan bilangan murid dalam kumpulan Dedikasi.

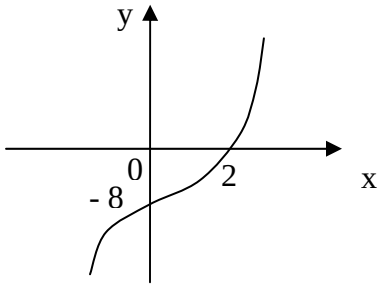
A 210 B 250 C 270 D 300

30. Which of the following graphs represents $y = 8 - x^3$?
Antara graf berikut, yang manakah mewakili $y = 8 - x^3$ *?*

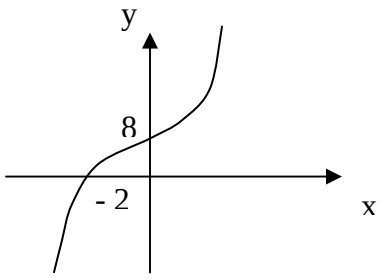
A



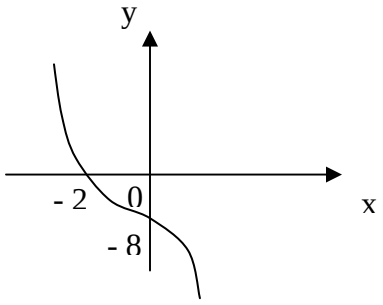
B



C



D



31. Diagram 14 shows a Venn diagram with the universal set $\xi = E \cup F \cup G$
Rajah 14 menunjukkan gambar rajah Venn dengan set semesta $\xi = E \cup F \cup G$

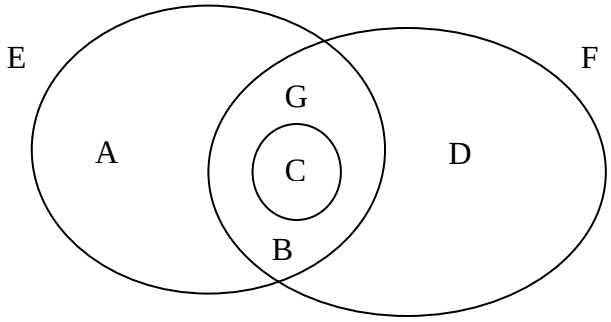


Diagram 14
Rajah 14

Considering the four regions, **A , B, C** and **D** , which of these represents the set $E \cap F \cap G'$
Antara kawasan ***A , B, C*** *dan* ***D*** *, yang manakah mewakili set* $E \cap F \cap G'$

32. Diagram 15 is a Venn diagram which shows the elements of sets P,Q and R.
Rajah 15 ialah gambar rajah Venn yang menunjukkan unsur-unsur bagi set P, set Q, dan set R.

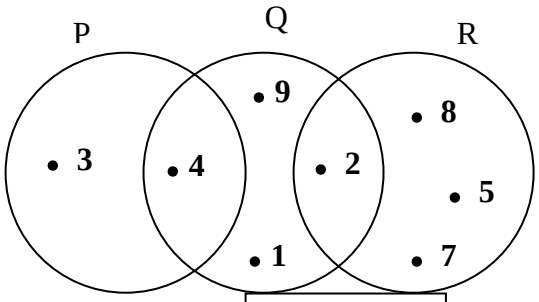


Diagram 15
Rajah 15

If the universal set $\xi = P \cup Q \cup R$,
then the set $(P \cup Q)' \cup R$
Jika set semesta $\xi = P \cup Q \cup R$,
maka set $(P \cup Q)' \cup R$

A $\{1,2,9\}$
B $\{5,7,8\}$
C $\{1,2,4,9\}$
D $\{2,5,7,8\}$

33 Given that the universal set $\xi = \{ x : 1 \le x \le 10,\ x \text{ is an integer}\}$,

P = {x ; x is a prime number} and Q = {x :x is a factor of 35}, find $\cap(P \cap Q)'$

Diberi set semesta $\xi = \{ x : 1 \le x \le 10,\ x \text{ ialah integer}\}$,

P= {x ; x ialah nombor perdana} dan Q = {x :x ialah factor 35}, Cari $\cap(P \cap Q)'$

A 2 B 3 C 7 D 8

34 Diagram 16 shows a straight line PQ on a Cartesian plane.
Rajah 16 menunjukkan garis lurus PQ pada satah Cartesian.

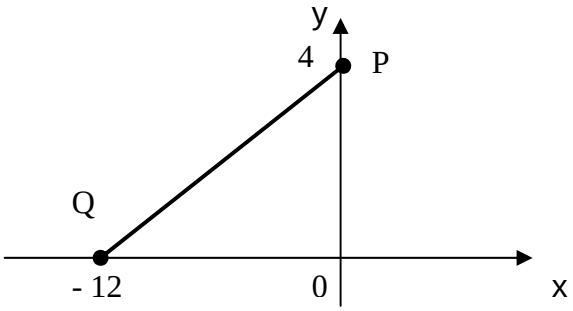


Diagram 16
Rajah 16

What is the gradient of PQ ?
Apakah kecerunan PQ ?

A -3 B $-\frac{1}{3}$

C $\frac{1}{3}$ D 3

35. Diagram 17 shows 10 identical cubes, labelled S, I, G, N , A,T, U, R, E and S.
Rajah 17 menunjukkan 10 kiub yang serupa berlabel S, I, G, N , A,T, U, R, E dan S.

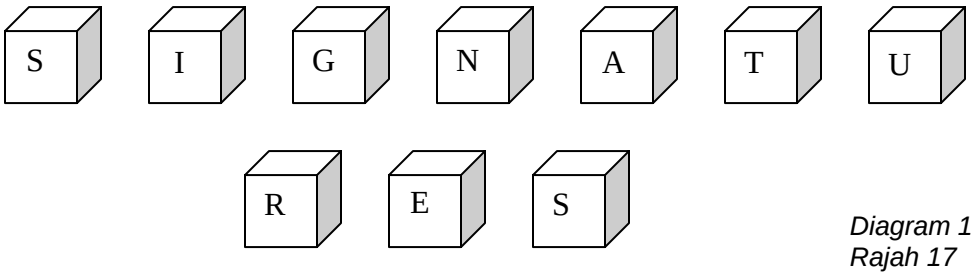


Diagram 17
Rajah 17

A cube is chosen at random.
State the probability that the cube chosen is a consonant.
Sebuah kiub dipilih secara rawak.
Nyatakan kebarangkallian bahawa kiub yang dipilih itu ialah konsonan.

A $\frac{3}{10}$ B $\frac{2}{5}$ C $\frac{7}{10}$ D $\frac{3}{5}$

36. A box contains 5 red pens, 3 blue pens and a number of black pens.
A pen is chosen at random from the box. The probability that a blue pen is chosen is $\frac{1}{6}$. Find the probability of choosing a black pen.

Sebuah kotak mengandungi 5 batang pen merah, 3 batang pen biru dan beberapa Batang pen hitam. Sebatang pen dipilih secara rawak dari kotak itu.

Kebarangkalian sebatang pen biru dipilih ialah $\frac{1}{6}$. *Cari kebarangkalian memilih sebatang pen hitam.*

A $\frac{1}{3}$ B $\frac{5}{9}$ C $\frac{1}{2}$ D $\frac{7}{9}$

37. Given $Y \propto \frac{1}{\sqrt{X}}$, and that $Y = 3$ when $X = 16$. The relation between Y and X is

Diberi bahawa $Y \propto \frac{1}{\sqrt{X}}$, *dan* $Y = 3$ *apabila* $X = 16$. *Hubungan diantara Y dan X ialah*

A $Y = \frac{8}{\sqrt{X}}$ B $Y = \frac{1}{6\sqrt{X}}$

C $Y = \frac{12}{\sqrt{X}}$ D $Y = \frac{4}{\sqrt{X}}$

38. Table 2 shows some values of the variables W, X and Y.
Jadual 2 menunjukkan beberapa nilai bagi pembolehubah W,X dan Y.

W	X	Y
6	3	9
p	4	8

Table 2
Jadual 2

It is given that W varies directly as the cube of X and inversely as Y.
Find the value of p.
Diberi bahawa W berubah secara langsung dengan kuasa tiga bagi X dan secara songsang dengan Y. Cari nilai p.

A 12 B 16

C 24 D 32

39. $\frac{1}{2}\begin{pmatrix}10 & -12\\ 8 & 4\end{pmatrix}+\begin{pmatrix}4 & 5\\ 0 & -2\end{pmatrix}=$

A $\begin{pmatrix}14 & -7\\ 8 & 2\end{pmatrix}$

B $\begin{pmatrix}9 & -7\\ 4 & 2\end{pmatrix}$

C $\begin{pmatrix}9 & -1\\ 4 & 0\end{pmatrix}$

D $\begin{pmatrix}7 & -1\\ 4 & 1\end{pmatrix}$

40 If $\begin{pmatrix}4 & -9\\ -3 & 5\end{pmatrix}+2\begin{pmatrix}1 & 0\\ n & -2\end{pmatrix}=\begin{pmatrix}6 & -9\\ -11 & 1\end{pmatrix}$, then n =

Jika $\begin{pmatrix}4 & -9\\ -3 & 5\end{pmatrix}+2\begin{pmatrix}1 & 0\\ n & -2\end{pmatrix}=\begin{pmatrix}6 & -9\\ -11 & 1\end{pmatrix}$, *maka* n =

A. -8

B. -7

C. - 6

D. - 4

END OF QUESTION PAPER