



PEPERIKSAAN PERCUBAAN SPM
 TAHUN 2020
 TINGKATAN 5

MATEMATIK

Kertas 1

Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas soalan ini mengandungi 40 soalan dalam Bahasa Inggeris dan diikuti dengan Bahasa Melayu.*
2. *Jawab semua soalan dengan menghitamkan satu jawapan sahaja pada kertas objektif yang diberikan.*
3. *Jika anda hendak menukar jawapan, padamkan ruang yang telah dihitamkan dengan bersih. Kemudian hitamkan jawapan anda yang baru pada kertas jawapan.*
4. *Gambar rajah di dalam soalan tidak dilukis mengikut skala kecuali yang telah dinyatakan.*
5. *Senarai rumus disediakan pada muka surat 2 dan 3.*

Disediakan oleh

.....
 (Pn Rohana Binti Paiman)
 Guru mata pelajaran Matematik

Disemak oleh

.....
 (Pn Mardiah Binti Hassan)
 Ketua Panitia Matematik

Disahkan oleh

.....
 (Pn Norli Binti Ismail)
 Ketua Bidang
 Sains & Matematik

Kertas soalan ini mengandungi 17 halaman bercetak.

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

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

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

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

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

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

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

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

SHAPES AND SPACE BENTUK DAN RUANG

- 1 Area of trapezium = $\frac{1}{2} \times \text{sum of parallel sides} \times \text{height}$
Luas trapezium = $\frac{1}{2} \times \text{hasil tambah sisi selari} \times \text{tinggi}$
- 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 = $2\pi r h$
- 5 Surface area of sphere = $4\pi r^2$
Luas permukaan sfera = $4\pi r^2$
- 6 Volume of right prism = cross sectional area \times length
Isi padu prisma tegak = luas keratan rentas \times panjang
- 7 Volume of cylinder = $\pi r^2 h$
Isi padu silinder = $\pi r^2 h$
- 8 Volume of cone = $\frac{1}{3} \pi r^2 h$
Isi padu kon = $\frac{1}{3} \pi r^2 h$
- 9 Volume of sphere = $\frac{4}{3} \pi r^3$
Isi padu sfera = $\frac{4}{3} \pi r^3$
- 10 Volume of right pyramid = $\frac{1}{3} \times \text{base area} \times \text{height}$
Isi padu 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 Scale factor, $k = \frac{PA'}{PA}$
Faktor skala, $k = \frac{PA'}{PA}$
- 15 Area of image = $k^2 \times \text{area of object}$
Luas imej = $k^2 \times \text{luas objek}$

5. Given $2^x + 2^3 = 101000_2$, find the value of x .

Diberi $2^x + 2^3 = 101000_2$, cari nilai x .

- A 3
- B 4
- C 5
- D 6

6. $100111_2 - 10101_2 =$

- A 10010_2
- B 10011_2
- C 11010_2
- D 11101_2

7. In Diagram 2, PQRS is a rhombus, PSTU is a trapezium and QST is a straight line.
 Dalam Rajah 2, PQRS ialah sebuah rombus, PSTU ialah sebuah trapezium dan QST ialah garis lurus.

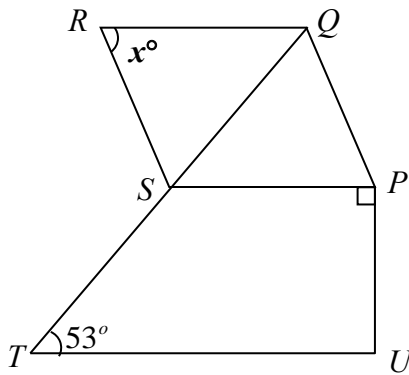


Diagram 2/ Rajah 2

The value of x is
 Nilai bagi x ialah

- A 53°
- B 58°
- C 73°
- D 74°

8. In Diagram 3, KLMNO is a regular pentagon. MOP is a straight line.
 Dalam Rajah 3, KLMNO ialah sebuah pentagon sekata. MOP ialah garis lurus.

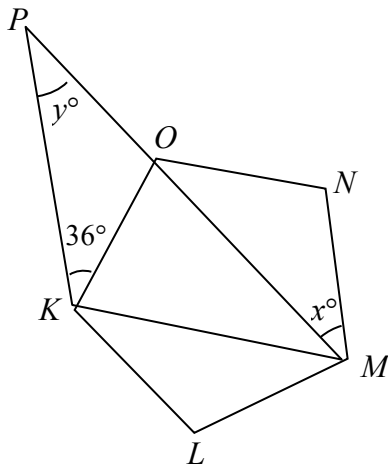
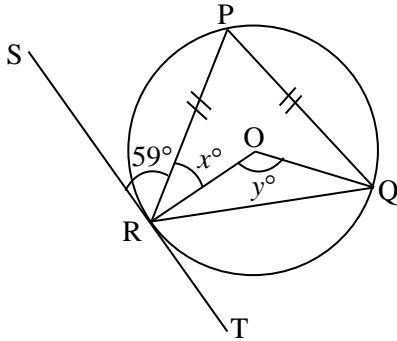


Diagram 3 / Rajah 3

The value of $x + y =$
 Nilai bagi $x + y =$

- A 36
- B 42
- C 72
- D 108

9. In Diagram 4, SRT is a tangent to a the circle PQR with centre O , at point R .
 Dalam Rajah 4 SRT ialah tangen kepada bulatan PQR yang berpusat O , di titik R .



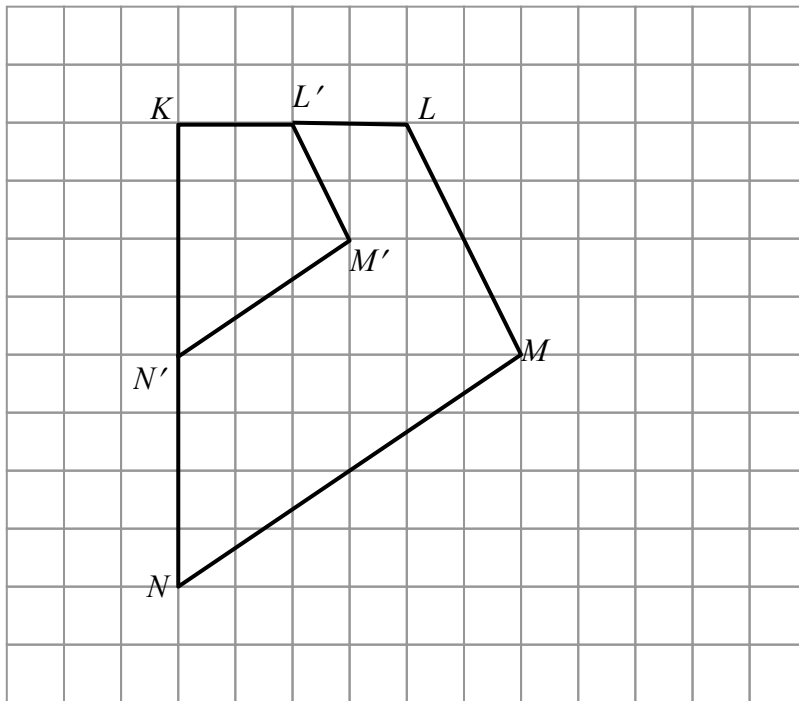
Find the value of $x + y$.

Cari nilai $x + y$.

- A 128°
- B 150°
- C 155°
- D 174°

Diagram 4 / Rajah 4

10. Diagram 5 shows two quadrilaterals, $KLMN$ and $KL'M'N'$ drawn on square grids. Quadrilateral $KL'M'N'$ is the image of quadrilateral $KLMN$ under an enlargement at centre P with the scale factor k .
 Rajah 5 menunjukkan dua buah sisi empat, $KLMN$ dan $KL'M'N'$ yang dilukis pada grid segi empat sama. Sisi empat $KL'M'N'$ ialah imej bagi sisi empat $KLMN$ di bawah satu pembesaran pada pusat P dengan faktor skala k .



Find the value of k .

Cari nilai k .

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

Diagram 5 / Rajah 5

11. Diagram 6 shows five points plotted on Cartesian plane.

Rajah 6 menunjukkan lima titik yang dilukis pada satah Cartes.

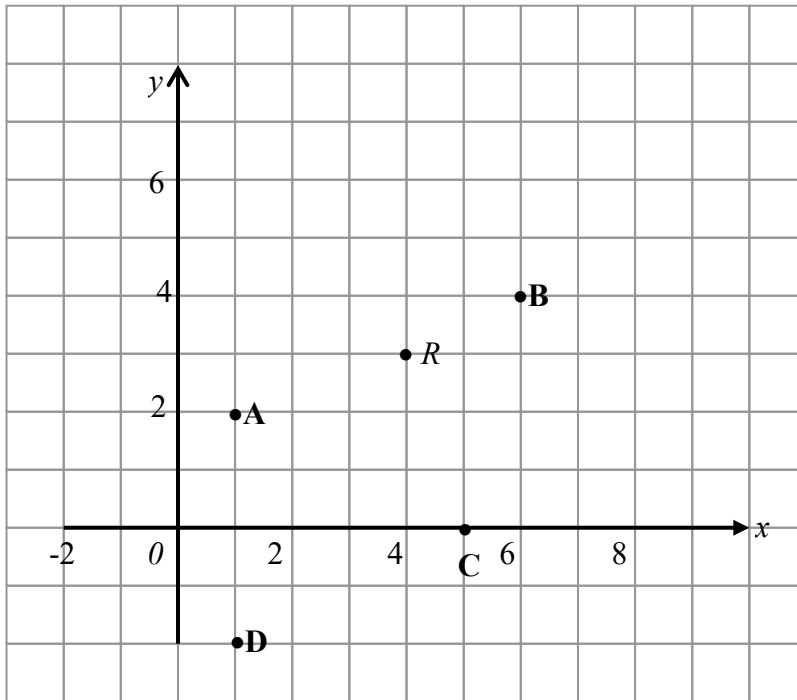


Diagram 6 / Rajah 6

Determine which of the point, **A**, **B**, **C** or **D**, is the image of point **R** under a 90° anticlockwise rotation about the centre $(3, 1)$.

*Kenal pasti antara titik **A**, **B**, **C** atau **D**, yang manakah imej bagi titik **R** di bawah satu putaran 90° lawan arah jam pada pusat $(3, 1)$.*

12. In Diagram 7, O is the centre of a unit circle.

Dalam Rajah 7, O ialah pusat bagi sebuah bulatan unit.

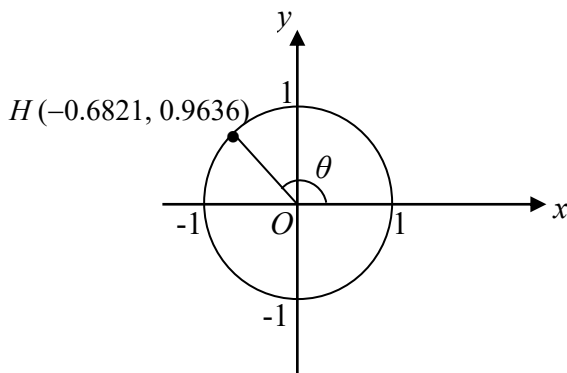


Diagram 7 / Rajah 7

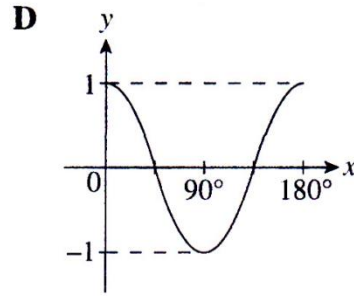
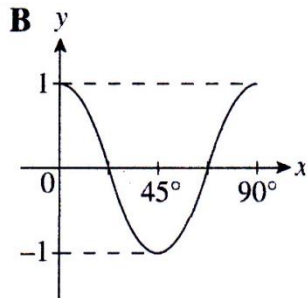
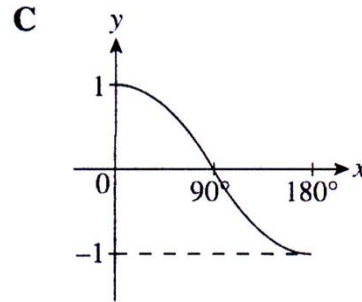
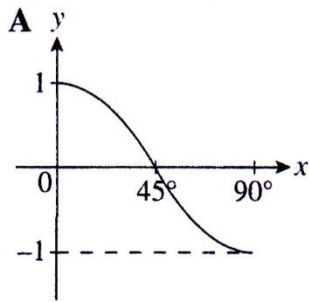
Find the value of $\sin \theta$.

Cari nilai $\sin \theta$.

- A -0.9636
- B -0.6821
- C 0.9636
- D 1.413

13. Which graphs represents part of $y = \cos x$?

Graf manakah yang mewakili sebahagian daripada $y = \cos x$?



14. Diagram 8 shows a cuboid with horizontal base $PQRS$.

Rajah 8 menunjukkan sebuah kuboid dengan tapak $PQRS$.

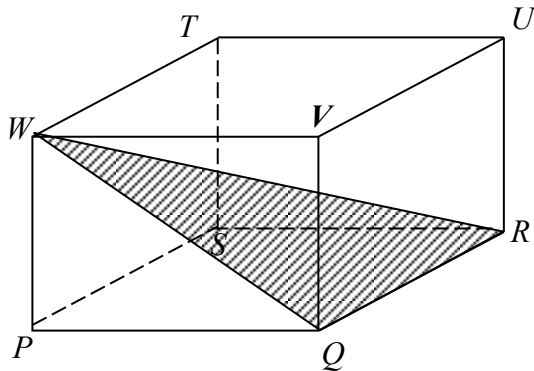


Diagram 8 / Rajah 8

Name the angle between the plane WQR and the plane $TUVW$.

Namakan sudut antara satah WQR dengan satah $TUVW$.

- A $\angle WQV$
- B $\angle WUR$
- C $\angle RWU$
- D $\angle QWV$

15. In Diagram 9, OP and MN are two vertical poles on a horizontal ground.

Dalam Rajah 9, OP dan MN ialah dua batang tiang tegak yang terletak pada tanah mengufuk.

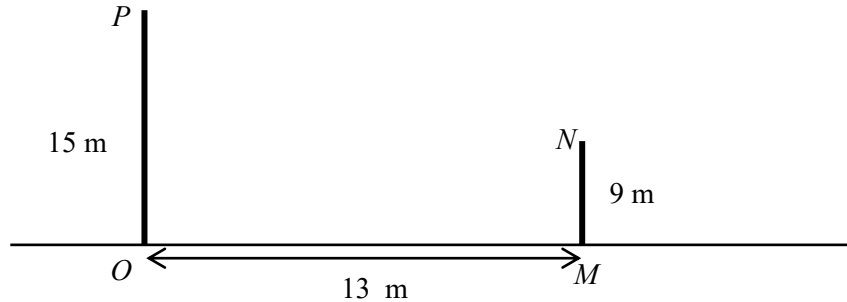


Diagram 9 / Rajah 9

Calculate the depression angle of vertex N from vertex P

Hitungkan sudut tunduk puncak N dari puncak P

- | | |
|---------------------------|---------------------------|
| A $24^{\circ} 47'$ | C $65^{\circ} 13'$ |
| B 24.47° | D 65.13° |

16. In Diagram 10, TU and RS to represented two building on flat ground. Given the depression angle U from S is 19°

Dalam Rajah 10, TU dan RS mewakili dua bangunan pada tanah mengufuk. Diberi bahawa sudut tunduk U dari S ialah 19° .

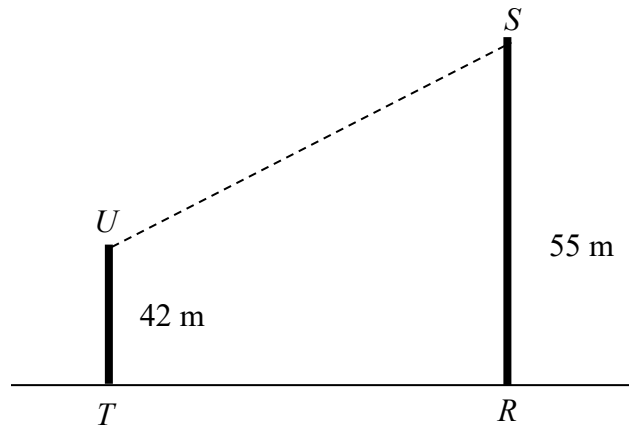


Diagram 10 / Rajah 10

Calculate distance with two building

Hitungkan jarak antara dua bangunan itu

- | | |
|----------------|----------------|
| A 37.75 | C 13.75 |
| B 39.93 | D 13 |

17. In Diagram 11 , Q is due east of P.
 Dalam Rajah 11 , Q terletak ke timur P.

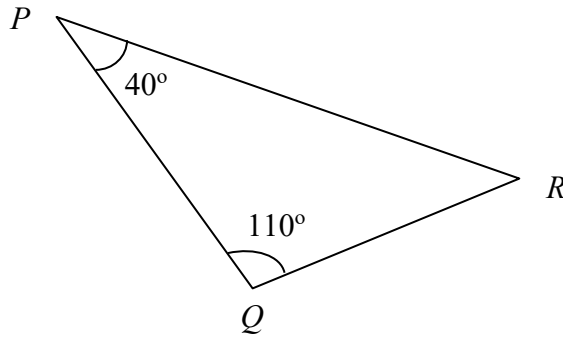


Diagram 11 / Rajah 11

Bearing of P from R is
 Bearing P dari R ialah

- | | | | |
|---|-----|---|-----|
| A | 050 | C | 200 |
| B | 150 | D | 230 |

18. In Diagram 12 , U is the North Pole, S is the South Pole and UOS is the axis of the earth.
 Dalam Rajah 12, U ialah Kutub Utara, S ialah Kutub Selatan dan UOS ialah paksi bumi.

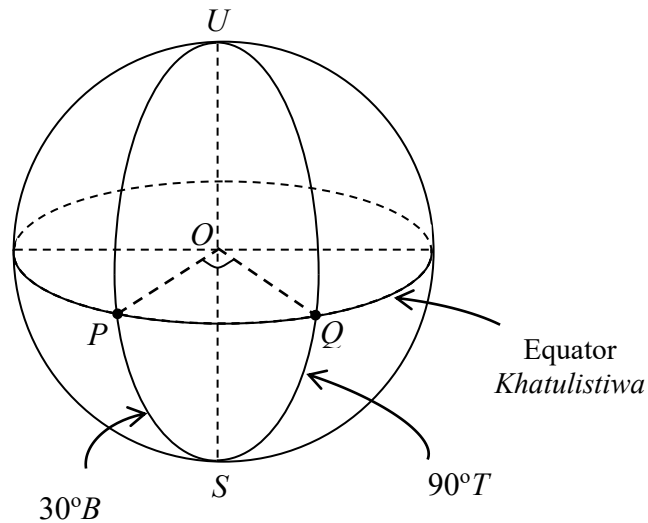


Diagram 12 / Rajah 12

Find the difference in longitude between P and Q.
 Carikan beza longitud antara P dengan Q.

- | | | | |
|---|-----|---|------|
| A | 30° | C | 120° |
| B | 90° | D | 150° |

19. $5j^2 - j(3 - j)$

A $4j^2 - 3$

C $6j^2 - 3$

B $4j^2 - 3j$

D $6j^2 - 3j$

20. Express $\frac{2}{3} \div \frac{t-5}{12t}$ as a single fraction in its simplest form.

Ungkapkan $\frac{2}{3} - \frac{t-5}{4t}$ sebagai satu pecahan tunggal dalam bentuk termudah.

A $\frac{8t}{t-5}$

C $\frac{5(t-3)}{t-5}$

B $\frac{7t}{t-5}$

D $\frac{5(t+3)}{t-5}$

21. Given that $m - 3(m - 2) = 3(m + 2n)$, express m in terms of n .

Diberi bahawa $m - 3(m - 2) = 3(m + 2n)$, ungkapkan m dalam sebutan n

A $\frac{6(n-1)}{5}$

C $\frac{-6(n+1)}{5}$

B $\frac{6(1-n)}{5}$

D $\frac{-2(n-3)}{5}$

22. Given that $5 + 4(s - 6) = 1 - s$, then $s =$

Diberi $5 + 4(s - 6) = 1 - s$, maka $s =$

A 0

C 6

B 4

D 10

23. The solution for $3 - k < 8$ and $6 + 2k \leq 2$ is

Penyelesaian bagi $3 - k < 8$ dan $6 + 2k \leq 2$ ialah

A $5 < k \leq -2$

C $-2 \leq k \leq 5$

B $-5 < k \leq -2$

D $-2 < k \leq 5$

24. Simplify $\frac{(\sqrt{64})^{\frac{1}{3}} \times 27^{\frac{2}{3}}}{2^3}$.

Permudahkan $\frac{(\sqrt{64})^{\frac{1}{3}} \times 27^{\frac{2}{3}}}{2^3}$

A $2^{-1} \times 3^2$

C $2^{-2} \times 3^3$

B $2^{-2} \times 3^2$

D $2^{-3} \times 3^2$

25. The solution for $3 - \frac{x}{2} > 5 - x$ is

Penyelesaian bagi $3 - \frac{x}{2} > 5 - x$

A $x < -4$

B $x < 4$

C $x > -4$

D $x > 4$

26. List all the integers y which satisfy the simultaneous linear inequalities $4y + 6 \geq -6$ and $2 - y \geq 0$.

Senaraikan semua integer y yang memuaskan ketaksamaan linear serentak $4y + 6 \geq -6$ dan $2 - y \geq 0$.

A $-3, -2, -1, 0, 1, 2$

B $-2, -1, 0, 1, 2$

C $-2, -1, 1, 2$

D $0, 1, 2$

27. Diagram 13 is a pie chart which shows the number of roses of four different colours in a garden.

Rajah 13 ialah carta pai yang menunjukkan bilangan bunga ros bagi empat jenis warna di sebuah taman.

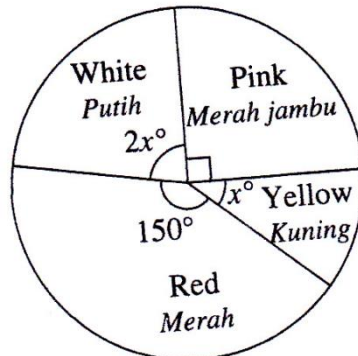


Diagram 13 / Rajah 13

The total number of roses in the garden is 1 440. Find the number of white roses in the garden.

Jumlah bilangan bunga ros di taman itu ialah 1 440. Cari bilangan bunga ros putih di taman itu.

A 160

B 240

C 320

D 480

28. Diagram 14 shows a bar chart for the number of customers going to a restaurant 'Pak Bul' on Monday, Tuesday and Wednesday of a particular week

Jadual Carta palang dalam Rajah 14 menunjukkan bilangan pembeli yang mengunjungi restoran Pak Bul pada hari Isnin, Selasa dan Rabu dalam satu minggu tertentu

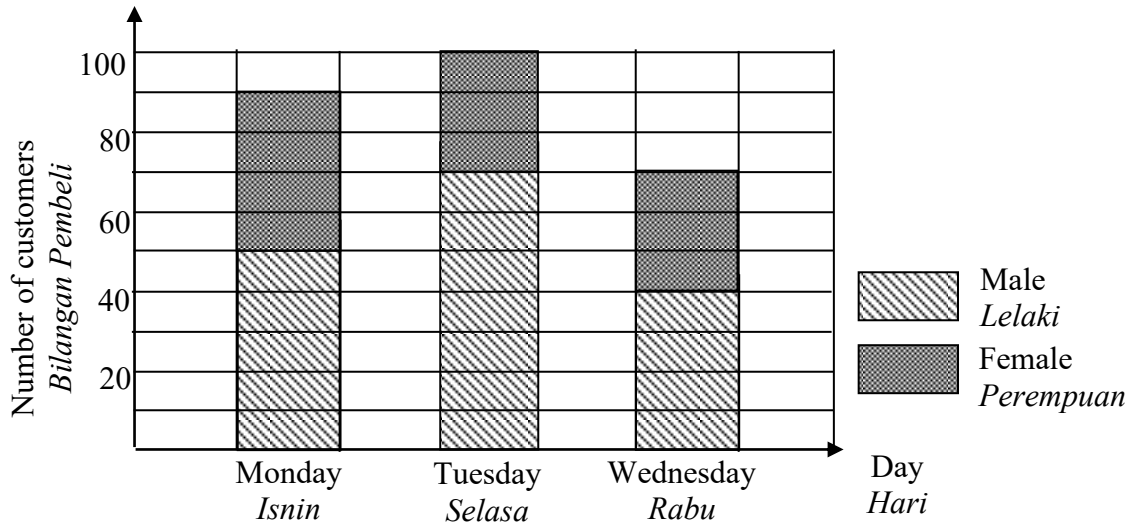


Diagram 14 / Rajah 14

The difference between male and female customers in three days is

Beza antara jumlah pembeli lelaki dan perempuan dalam tempoh tiga hari itu ialah

- A 30
- B 60
- C 90
- D 150

29. Table 1 shows the frequency of the score obtained in a game.

Jadual 1 menunjukkan kekerapan bagi skor yang diperolehi dalam satu permainan.

Score / Skor	0	1	2	3	4
Number of student / Bilangan pelajar	x	4	2	3	6

Table 1 / Jadual 1

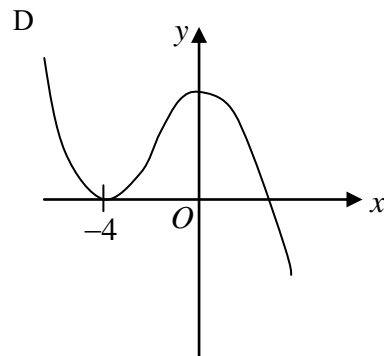
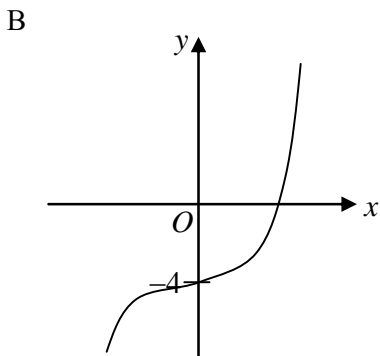
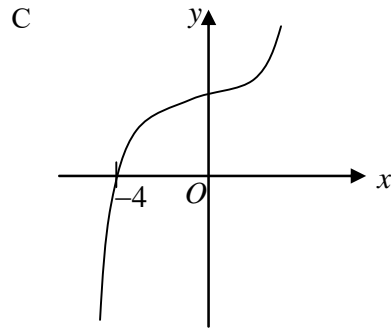
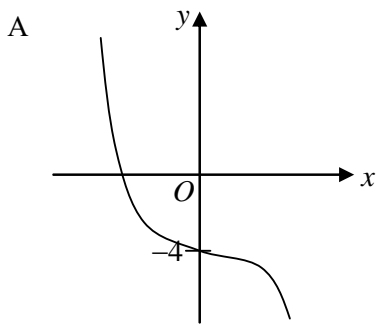
Given that the median score is 2, find the value of x.

Diberi bahawa skor median ialah 2, cari nilai x.

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

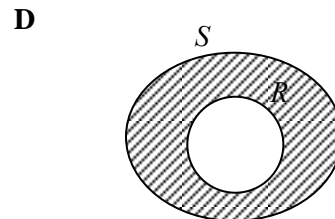
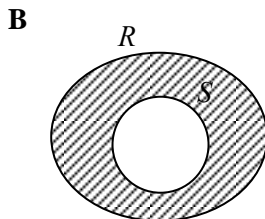
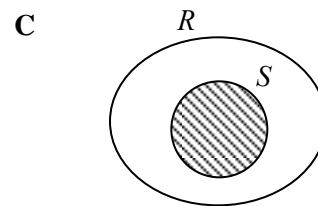
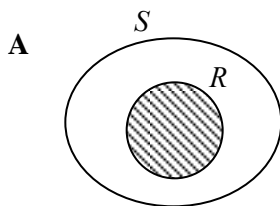
30. Determine which of the following graphs represents $y = 2x^3 - 4$.

Kenal pasti graf berikut, yang manakah mewakili graf $y = 2x^3 - 4$.



31. Which of the following Venn diagrams represent $R' \cap S$ where universal set $\xi = R \cup S$.

Antara berikut, gambar rajah Venn yang manakah mewakili $R' \cap S$ dengan keadaan set semesta $\xi = R \cup S$.



32. Diagram 15 shows a Venn diagram with the universal set $\xi = \{ \text{Form 5 students} \}$, set $B = \{ \text{students who come to school by bus} \}$ and set $C = \{ \text{students who come to school by car} \}$.

Rajah 15 menunjukkan sebuah Gambar rajah Venn dengan set semesta $\xi = \{ \text{pelajar Tingkatan 5} \}$, set $B = \{ \text{pelajar yang menaiki bas ke sekolah} \}$ dan set $C = \{ \text{pelajar yang menaiki kereta ke sekolah} \}$.

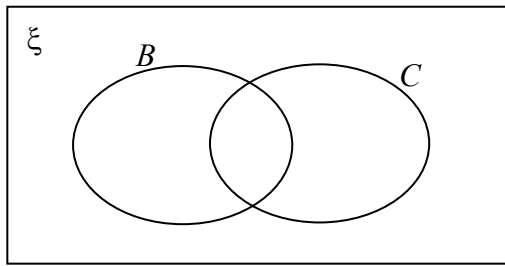


Diagram 15 / Rajah 15

Given that $n(B) = 92$, $n(C) = 108$, $n(B \cap C) = 20$ and the number of students who do not come to school by either vehicles is 6. Find the total number of Form 5 students.

Diberi bahawa $n(B) = 92$, $n(C) = 108$, $n(B \cap C) = 20$ dan bilangan pelajar yang tidak menaiki kedua-dua kenderaan ke sekolah ialah 6. Cari bilangan pelajar Tingkatan 5.

A 172

C 186

B 180

D 226

33. In diagram 16, PQ is a straight line

Dalam Rajah 16, PQ ialah garis lurus.

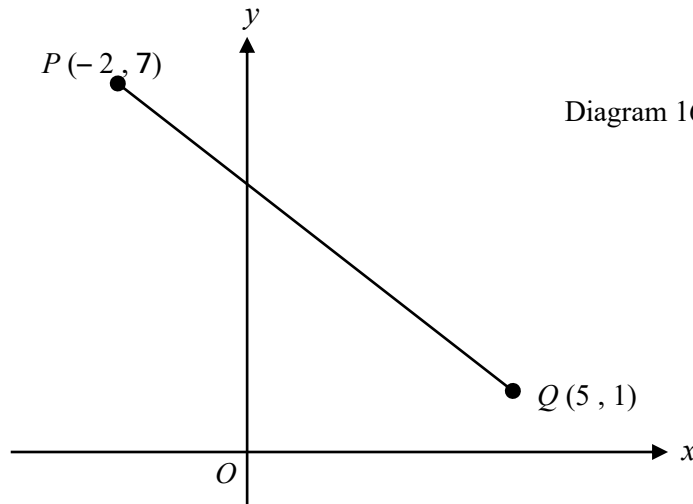


Diagram 16 / Rajah 16

Calculate the gradient of PQ and y -intercept.

Kirakan kecerunan PQ dan pintasan- y

A $-\frac{6}{7}$, pintasan $y = \frac{37}{7}$

C $\frac{6}{7}$, pintasan $y = \frac{-37}{7}$

B $-\frac{7}{3}$, pintasan $y = \frac{7}{37}$

D $\frac{7}{3}$, pintasan $y = \frac{-7}{37}$

34. A straight line RS with gradient $\frac{1}{4}$ passes through the point $(4, 9)$. Find the y -intercept of the straight line RS .

Garis lurus RS dengan kecerunan $\frac{1}{4}$ melalui titik $(4, 9)$. Cari pintasan- y bagi garis lurus RS .

- A 7
B 9
C 10
D 12

35. A box contains 42 red pens and blue pens. If a pen is picked randomly from the box, the probability of picking a blue pen is $\frac{4}{7}$. Find the number of red pen.

Sebuah kotak mengandungi 42 pen merah dan pen biru. Jika sebatang pen dipilih secara rawak daripada kotak itu, kebarangkalian memilih sebatang pen biru ialah $\frac{4}{7}$. Cari bilangan pen merah.

- A 18
B 24
C 38
D 42

36. A two digit number is created from the digits in the set R . Given that $R = \{x : 12 < x \leq 14, x \text{ is an integer}\}$. Find the probability that the sum of the two digits is greater than 5.

Nombor dua digit diwujudkan daripada digit-digit di dalam set R . Diberi bahawa $R = \{x : 12 < x \leq 14, x \text{ ialah satu integer}\}$. Cari kebarangkalian bahawa jumlah nombor dua digit itu lebih besar daripada 5.

- A 0
B $\frac{1}{3}$
C $\frac{2}{3}$
D 1

37. Table 2 shows the relation between three variables g , h and f . Given that g varies directly as h and varies inversely as f .

Jadual 2 menunjukkan hubungan di antara tiga pembolehubah g , h and f . Diberi bahawa g berubah secara langsung dengan h dan berubah secara songsang dengan f .

g	h	F
3	x	6
2.5	10	2

Table 2 / Jadual 2

Find the value of x .

Cari nilai x .

- A 4
B 18
C 25
D 36

38. Given that $y \propto \frac{1}{(x+2)^n}$ and $y = \frac{1}{2}$ when $n = 2$ and $x = 2$. Find the value of n when $y = 1$ and $x = 6$.

Diberi bahawa $y \propto \frac{1}{(x+2)^n}$ dan $y = \frac{1}{2}$ apabila $n = 2$ dan $x = 2$. Cari nilai n apabila $y = 1$ dan $x = 6$.

A 1

C $\frac{1}{2}$

B 2

D $\frac{1}{8}$

39. $(5 \ 8) - (-4 \ 3) + \frac{1}{2} (6 \ -8) =$

A $(4 \ 15)$ C $(12 \ -2)$ B $(12 \ 1)$ D $(15 \ -5)$

40. Given that $5 \binom{m}{n} = \binom{1 \ 5}{2 \ 0} \binom{-3}{4}$

The value of $m + n$ is

Diberi $5 \binom{m}{n} = \binom{1 \ 5}{2 \ 0} \binom{-3}{4}$

Nilai bagi $m + n$ ialah

A $\frac{1}{2}$ C $\frac{10}{7}$ B $\frac{2}{3}$ D $\frac{11}{5}$

**END OF QUESTION PAPER
KERTAS SOALAN TAMAT**

PERATURAN PEMARKAHAN KERTAS 1

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