

TERHAD



i-MODUL KECEMERLANGAN SPM SMKA DAN SABK 2023

## SIJIL PELAJARAN MALAYSIA 2023 (SET 2)

MATEMATIK

1449/1

KERTAS 1

$1\frac{1}{2}$  jam

Satu jam tiga puluh minit

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**JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU**

1. *Kertas ini mengandungi 40 soalan dan dalam dwibahasa.*
2. *Jawab SEMUA soalan.*
3. *Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.*
4. *Satu senarai rumus disediakan di halaman 2, 3 dan 4.*
5. *Anda dibenarkan menggunakan kalkulator saintifik.*

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Kertas peperiksaan ini mengandungi 34 halaman bercetak.

**NOMBOR DAN OPERASI  
NUMBER AND OPERATIONS**

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1 <math>a^m \times a^n = a^{m+n}</math></p> <p>3 <math>(a^m)^n = a^{mn}</math></p> <p>5 <math>a^{\frac{m}{n}} = (a^m)^{\frac{1}{n}} = (a^{\frac{1}{n}})^m</math></p> <p>7 Faedah mudah / <i>Simple interest, I=Prt</i></p> <p>9 Jumlah bayaran balik / <i>Total repayment, A = P + Prt</i></p> <p>10 Premium = <math>\frac{\text{Nilai muka polisi}}{\text{RMx}} \times (\text{Kadar premium per RMx})</math><br/> <i>Premium = <math>\frac{\text{Face value of policy}}{\text{RMx}} \times (\text{Premium rate per RMx})</math></i></p> <p>11 Jumlah insurans yang harus dibeli = <math>\left( \begin{array}{l} \text{Peratusan} \\ \text{ko-insurans} \end{array} \right) \times \left( \begin{array}{l} \text{Nilai boleh} \\ \text{insurans harta} \end{array} \right)</math><br/> <i>Amount of required insurance = <math>\left( \begin{array}{l} \text{Percentage of} \\ \text{co-insurance} \end{array} \right) \times \left( \begin{array}{l} \text{Insurable value} \\ \text{of property} \end{array} \right)</math></i></p> | <p>2 <math>a^m \div a^n = a^{m-n}</math></p> <p>4 <math>a^{\frac{1}{n}} = \sqrt[n]{a}</math></p> <p>6 <math>a^{\frac{m}{n}} = \sqrt[n]{a^m} = (\sqrt[n]{a})^m</math></p> <p>8 Nilai matang/<i>Maturity value, MV = P \left(1 + \frac{r}{n}\right)^{nt}</i></p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**PERKAITAN DAN ALGEBRA  
RELATIONSHIP AND ALGEBRA**

- |                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1 Jarak/<i>Distance</i><br/> <math>= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}</math></p> <p>3 Laju Purata = <math>\frac{\text{Jumlah jarak}}{\text{Jumlah masa}}</math><br/> <i>Average speed = <math>\frac{\text{Total distance}}{\text{Total time}}</math></i></p> <p>5 <math>A^{-1} = \frac{1}{ad - bc} \begin{pmatrix} d &amp; -b \\ -c &amp; a \end{pmatrix}</math></p> | <p>2 Titik Tengah / <i>midpoint,</i><br/> <math>(x, y) = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)</math></p> <p>4 <math>m = \frac{y_2 - y_1}{x_2 - x_1}</math></p> <p>6 <math>m = -\frac{\text{pintasan-y}}{\text{pintasan-x}}</math><br/> <math>m = -\frac{\text{y-intercept}}{\text{x-intercept}}</math></p> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**SUKATAN DAN GEOMETRI**  
**MEASUREMENT AND GEOMETRY**

- 1 Teorem Pythagoras / *Pythagoras Theorem*  $c^2 = a^2 + b^2$
  
- 2 Hasil tambah sudut pedalaman poligon / *Sum of interior angles of a polygon*  
 $= (n - 2) \times 180^\circ$
  
- 3 Lilitan bulatan =  $\pi d = 2\pi j$   
*Circumference of circle* =  $\pi d = 2\pi r$
  
- 4 Luas bulatan =  $\pi j^2$   
*Area of circle* =  $\pi r^2$   
$$\frac{\text{Panjang lengkok}}{2\pi j} = \frac{\theta}{360^\circ}$$
  
- 5 
$$\frac{\text{Arc length}}{2\pi r} = \frac{\theta}{360^\circ}$$
  
- 6 
$$\frac{\text{Luas sektor}}{\pi j^2} = \frac{\theta}{360^\circ}$$
  
$$\frac{\text{Area of sector}}{\pi r^2} = \frac{\theta}{360^\circ}$$
  
- 7 Luas layang =  $\frac{1}{2} \times$  hasil darab panjang dua pepenjuru  
*Area of kite* =  $\frac{1}{2} \times$  product of two diagonals
  
- 8 Luas trapezium =  $\frac{1}{2} \times$  hasil tambah dua sisi selari  $\times$  tinggi  
*Area of trapezium* =  $\frac{1}{2} \times$  sum of parallel sides  $\times$  height
  
- 9 Luas permukaan silinder =  $2 \pi j^2 + 2 \pi jt$   
*Surface area of cylinder* =  $2 \pi r^2 + 2 \pi rh$
  
- 10 Luas permukaan kon =  $\pi j^2 + \pi js$   
*Surface area of cone* =  $\pi r^2 + \pi rs$
  
- 11 Luas permukaan sfera =  $4\pi j^2$   
*Surface area of sphere* =  $4\pi r^2$
  
- 12 Isi padu prisma tegak = luas keratan rentas  $\times$  tinggi  
*Volume of right prism* = cross sectional area  $\times$  height
  
- 13 Isi padu silinder =  $\pi j^2 t$   
*Volume of cylinder* =  $\pi r^2 h$

- 14 Isi padu kon =  $\frac{1}{3}\pi r^2 h$   
*Volume of cone* =  $\frac{1}{3}\pi r^2 h$
- 15 Isi padu sfera =  $\frac{4}{3}\pi r^3$   
*Volume of sphere* =  $\frac{4}{3}\pi r^3$
- 16 Isi padu piramid tegak =  $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$   
*Volume of right pyramid* =  $\frac{1}{3} \times \text{base area} \times \text{height}$
- 17 Faktor skala,  $k = \frac{PA'}{PA}$   
*Scale factor*,  $k = \frac{PA'}{PA}$
- 18 Luas imej =  $k^2 \times \text{luas objek}$   
*Area of image* =  $k^2 \times \text{area of object}$

**STATISTIK DAN KEBARANGKALIAN**  
**STATISTICS AND PROBABILITY**

- 1 Min / Mean,  $\bar{x} = \frac{\sum x}{N}$
- 2 Min / Mean,  $\bar{x} = \frac{\sum fx}{f}$
- 3 Varians / Variance,  $\sigma^2 = \frac{\sum (x - \bar{x})^2}{N} = \frac{\sum x^2}{N} - \bar{x}^2$
- 4 Varians / Variance,  $\sigma^2 = \frac{\sum f(x - \bar{x})^2}{\sum f} = \frac{\sum fx^2}{\sum f} - \bar{x}^2$
- 5 Sisihan piawai / Standard deviation,  $\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{N}} = \sqrt{\frac{\sum x^2}{N} - \bar{x}^2}$
- 6 Sisihan piawai / Standard deviation,  $\sigma = \sqrt{\frac{\sum f(x - \bar{x})^2}{\sum f}} = \sqrt{\frac{\sum fx^2}{\sum f} - \bar{x}^2}$
- 7  $P(A) = \frac{n(A)}{n(S)}$
- 8  $P(A') = 1 - P(A)$

Jawab **semua** soalan

*Answer all questions*

- 1 Ungkapkan  $4.062 \times 10^{-2}$  sebagai satu nombor tunggal yang betul kepada 3 angka bererti.

*Express  $4.062 \times 10^{-2}$  as a single number correct to 3 significant figures.*

- A 0.04
- B 0.040
- C 0.0406
- D 0.04062

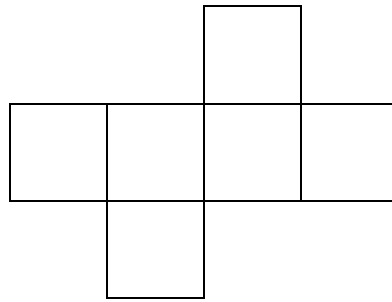
- 2 Diberi bahawa laju cahaya ialah  $3 \times 10^5 \text{ kms}^{-1}$ , cari jarak, dalam km, yang dilalui oleh cahaya dalam masa 26 minit. Nyatakan jawapan dalam bentuk piawai.

*Given that the speed of light is  $3 \times 10^5 \text{ kms}^{-1}$ , find the distance, in km, travelled by light in 26 minutes. Express the answer in standard form.*

- A  $4.68 \times 10^9$
- B  $4.68 \times 10^8$
- C  $7.8 \times 10^6$
- D  $1.3 \times 10^5$

- 3 Rajah 1 menunjukkan bentangan sebuah kubus.

*Diagram 1 shows the net of a cube.*



Rajah 1

*Diagram 1*

Diberi bahawa isi padu bagi kubus itu ialah  $4096 \text{ m}^3$ . Hitung jumlah luas permukaan, dalam  $\text{cm}^2$ , bentangan itu.

*It is given that the volume of the cube is  $4096 \text{ m}^3$ . Calculate the totals surface area, in  $\text{cm}^2$ , of the net.*

- A  $1.536 \times 10^3$   
 B  $1.536 \times 10^5$   
 C  $1.536 \times 10^7$   
 D  $1.536 \times 10^9$
- 4 Tukarkan  $2 \times 7^4 + 3 \times 7^2 + 6$  kepada satu nombor dalam asas tujuh.

*Convert  $2 \times 7^4 + 3 \times 7^2 + 6$  to a number in base seven.*

- A  $2036_7$   
 B  $2360_7$   
 C  $20306_7$   
 D  $20360_7$

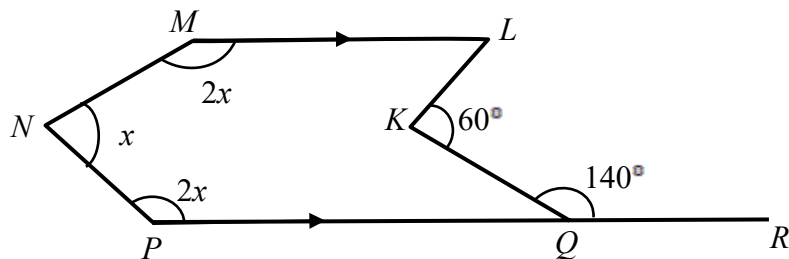
- 5 Diberi bahawa  $8^2x + y = 110000010_2$ , dengan keadaan  $x$  dan  $y$  ialah integer positif yang kurang daripada lapan. Cari nilai  $x$  dan  $y$ .

*It is given that  $8^2x + y = 110000010_2$ , where  $x$  and  $y$  are positive integers less than eight. Find the values of  $x$  and  $y$ .*

- A  $x = 2, y = 1$
- B  $x = 4, y = 2$
- C  $x = 5, y = 2$
- D  $x = 6, y = 2$

- 6 Rajah 2 menunjukkan sebuah poligon  $KLMNPQ$ .  $PQR$  ialah garis lurus.

*Diagram 2 shows a polygon  $KLMNPQ$ .  $PQR$  is a straight line.*



Rajah 2  
Diagram 2

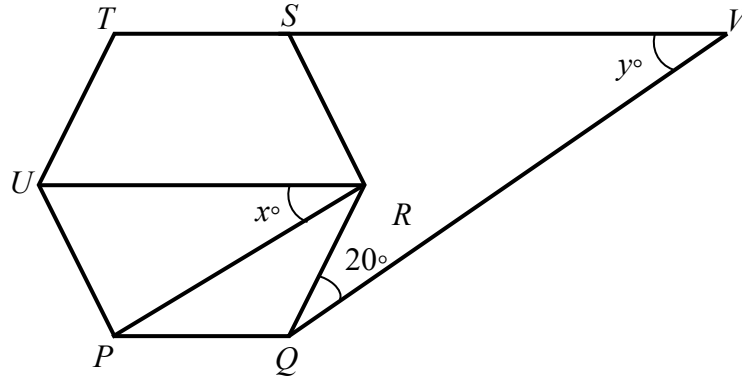
Cari nilai  $x$ .

*Find the value of  $x$ .*

- A  $28^\circ$
- B  $70^\circ$
- C  $72^\circ$
- D  $74^\circ$

- 7 Rajah 3 menunjukkan sebuah heksagon sekata  $PQRSTU$  dan sebuah sisiempat  $QRSV$ .  $TSV$  adalah garis lurus.

*Diagram 3 shows a regular hexagon  $PQRSTU$  and a quadrilateral  $QRSV$ .  $TSV$  is a straight line.*



Rajah 3

Diagram 3

Cari nilai  $x + y$ .

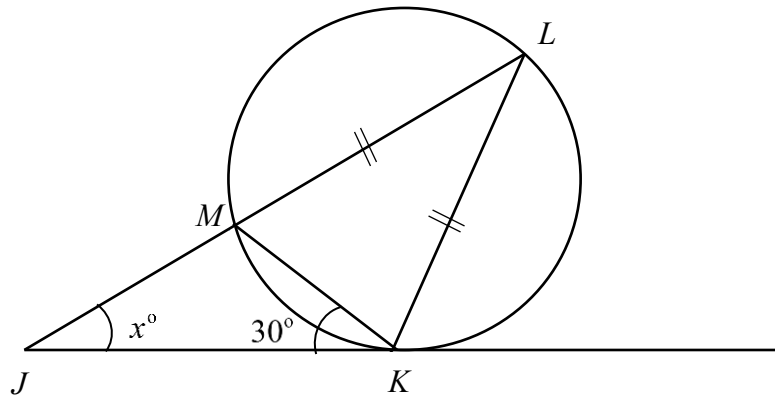
*Find the value of  $x + y$ .*

- A 30
- B 40
- C 60
- D 70



- 8 Dalam Rajah 4,  $JK$  ialah tangen kepada bulatan  $KLM$  di  $K$  dan  $JML$  ialah garis lurus.

*In Diagram 4,  $JK$  is a tangent to the circle  $KLM$  at  $K$  and  $JML$  is a straight line.*



Rajah 4

Diagram 4

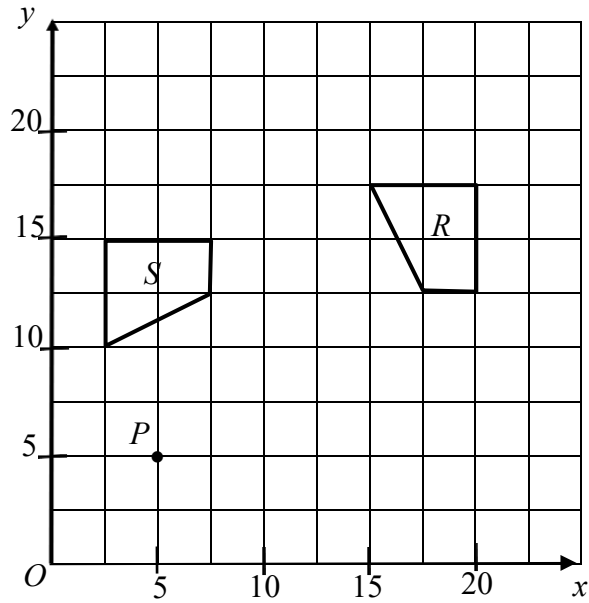
Nilai  $x$  ialah

*The value of  $x$  is*

- A 30
- B 45
- C 60
- D 75

- 9 Rajah 5 menunjukkan dua buah poligon,  $R$  dan  $S$  yang dilukis pada suatu satah Cartes.

*Diagram 5 shows two polygons,  $R$  and  $S$  drawn on a Cartesian plane.*



Rajah 5  
Diagram 5

$R$  ialah imej bagi  $S$  di bawah suatu transformasi. Cari koordinat imej bagi titik  $P$  di bawah transformasi yang sama.

$R$  is the image of  $S$  under a transformation. Find the image coordinates of the point  $P$  under the same transformation.

- A (10, 15)
- B (15, 0)
- C (0, 10)
- D (20, 10)

- 10 Rajah 6 menunjukkan beberapa buah trapezium dilukis pada suatu satah Cartes. Diberi bahawa transformasi

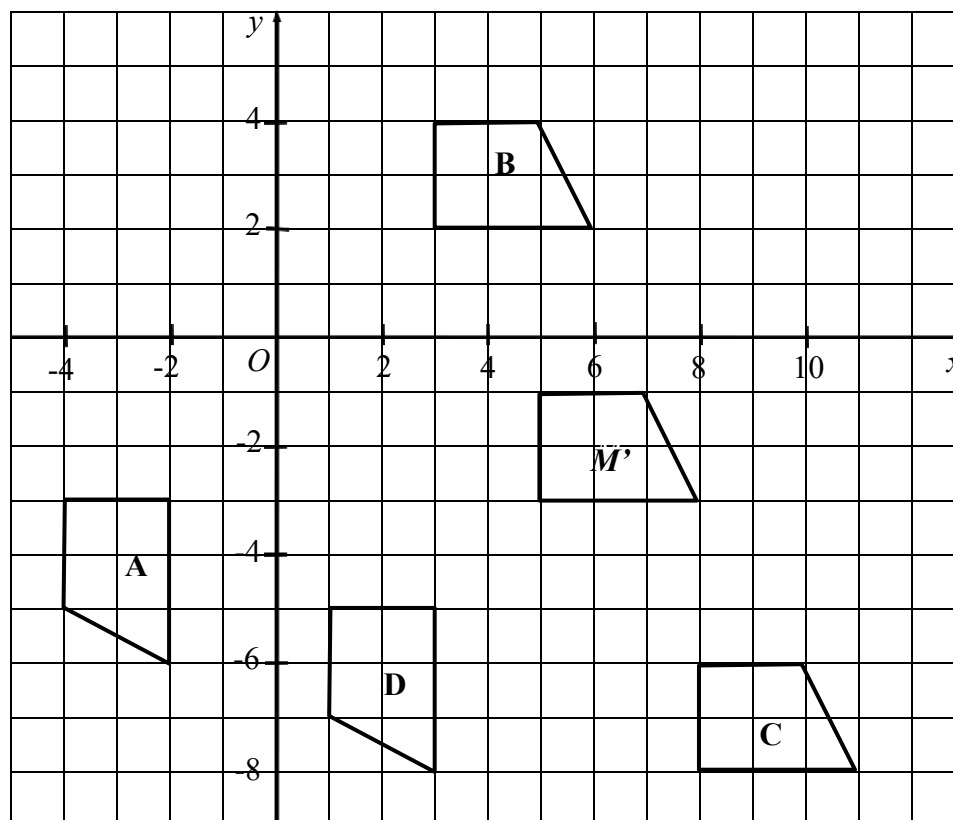
*Diagram 6 shows several trapeziums drawn on a Cartesian plane. It is given that transformation*

$$\mathbf{J} = \text{translasi} \begin{pmatrix} 2 \\ -5 \end{pmatrix}$$

$$\text{translation} \begin{pmatrix} 2 \\ -5 \end{pmatrix}$$

$$\mathbf{K} = \text{pantulan pada garis } y = -x$$

$$\text{reflection on line } y = -x$$



Rajah 6

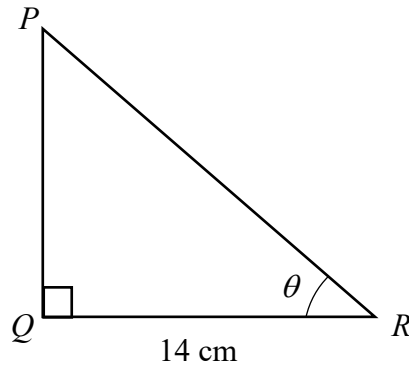
Diagram 6

Antara trapezium A, B, C dan D, yang manakah objek bagi  $M'$  di bawah gabungan transformasi  $JK$ ?

*Which of the trapezium A, B, C and D, is the object  $M'$  under the combined transformation  $JK$ ?*

11 Rajah 7 menunjukkan sebuah segitiga bersudut tegak  $PQR$ .

*Diagram 7 shows a right-angled triangle  $PQR$ .*



Rajah 7

*Diagram 7*

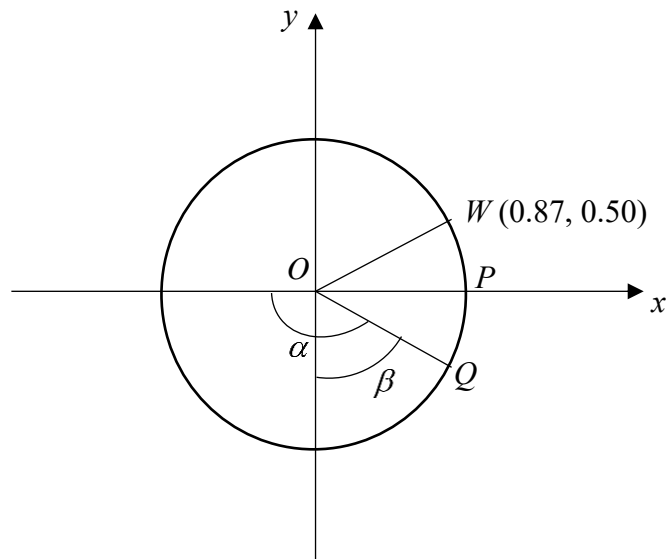
Diberi  $QR = 14$  cm dan  $\tan \theta = \frac{24}{7}$ , hitung perimeter, dalam cm, segitiga bersudut tegak itu.

*Given  $QR = 14$  cm and  $\tan \theta = \frac{24}{7}$ , find the perimeter, in cm, of the right-angled triangle.*

- A 56
- B 66
- C 84
- D 112

- 12 Dalam Rajah 8, titik  $W$  terletak di atas lengkok suatu bulatan unit berpusat  $O$ . Lengkuk minor  $WP$  dan  $PQ$  adalah sama panjang.

*In the Diagram 8, point  $W$  lies on the arc of a circle with centre,  $O$ . The minor arcs  $WP$  and  $PQ$  have the same length.*



Rajah 8  
Diagram 8

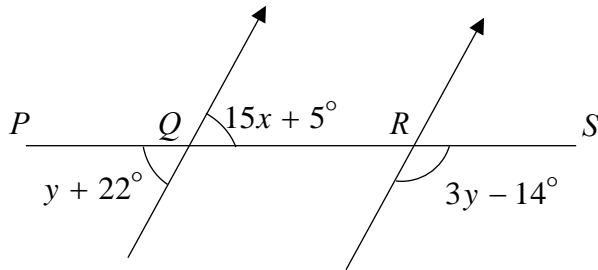
Cari nilai  $\cos \alpha + \tan \beta$ .

*Find the value of  $\cos \alpha + \tan \beta$ .*

- A 1.74
- B 0.87
- C  $-0.87$
- D  $-0.50$

13 Dalam Rajah 9,  $PQRS$  ialah garis lurus.

*In Diagram 9,  $PQRS$  is a straight line.*



Rajah 9  
Diagram 9

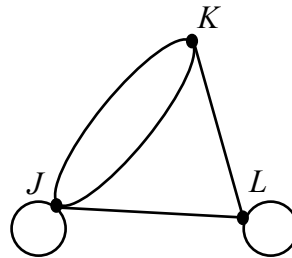
Cari nilai  $y - x$ .

*Find the value of  $y - x$ .*

- A  $47^\circ$
- B  $43^\circ$
- C  $39^\circ$
- D  $28^\circ$

- 14 Rajah 10 menunjukkan satu graf yang mempunyai gelung dan berbilang tepi.

*Diagram 10 shows a graph that has loops and multiple edges.*



Rajah 10  
Diagram 10

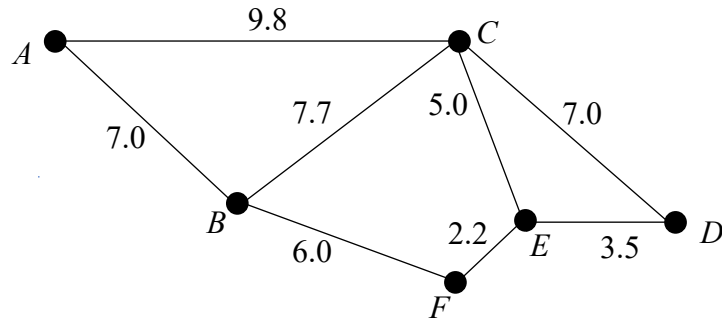
Antara berikut, yang manakah ialah set tepi bagi graf itu?

*Which of the following is the set of edges for the graph?*

- A  $\{(J, J), (J, K), (K, L), (J, L), (L, L)\}$
- B  $\{(J, J), (J, K), (J, K), (K, L), (J, L), (L, L)\}$
- C  $\{(J, J), (J, K), (K, L), (K, L), (J, L)\}$
- D  $\{(J, J), (L, L), (J, L), (J, L), (K, L), (J, K)\}$

- 15 Rajah 11 menunjukkan suatu graf tak terarah dan berpemberat. Nilai pemberat mewakili jarak dalam km.

*Diagram 11 shows an undirected and weighted graph. The weight represents the distance, in km.*



Rajah 11  
Diagram 11

Hitung beza antara jarak terpanjang dan jarak terpendek, dalam meter, dari bucu *A* ke bucu *E*.

*Calculate the difference between the longest and shortest distance, in meters from point *A* to point *E*.*

- A 10 900
- B 10 500
- C 5 500
- D 4 900



16 Jadual 1 menunjukkan maklumat bagi buku yang dibeli oleh Muhd Fauzi.

*The table 1 shows the information of books bought by Muhd Fauzi.*

<b>Mata Pelajaran</b> <i>Subject</i>	<b>Harga sebuah buku</b> <i>Price per book</i>
Matematik <i>Mathematics</i>	RM 12.70
Sains <i>Science</i>	RM 8.50

Jadual 1

*Table 1*

Muhd Fauzi telah membeli 7 buah buku dan membayar dengan sekeping wang kertas RM100. Dia mendapat pulangan baki sebanyak RM23.70. Berapakah jumlah buku matematik yang dibeli oleh Muhd Fauzi?

*Muhd Fauzi bought 7 books and paid with a RM100 note. He got the balance of RM23.70. How many mathematics books did Muhd Fauzi buy?*

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

17 Permudahkan

*Simplify*

$$\frac{4pq^2r \times (-12r^2q)}{-16p^2q^2r^2}$$

A  $\frac{3pq}{r}$

B  $\frac{3rq}{p}$

C  $3pqr$

D  $\frac{3q^2}{pr}$

18 Diberi  $L = \sqrt{4M+3}$ , ungkapkan  $M$  dalam sebutan  $L$ .

*Given  $L = \sqrt{4M+3}$ , express  $M$  in terms of  $L$ .*

A  $M = \frac{\sqrt{L}-3}{4}$

B  $M = \sqrt{L}+3$

C  $M = \frac{L^2-3}{4}$

D  $M = \frac{L^2+3}{4}$

19 Apakah nilai  $m$  jika  $32^m = 64^{m-3}$ ?

*What is the value of  $m$  if  $32^m = 64^{m-3}$ ?*

A  $m = 3$

B  $m = -3$

C  $m = -18$

D  $m = 18$

- 20 Fateh menerima wang saku sebanyak  $\text{RM}(k^2 - 25)$  untuk  $(k + 5)$  hari. Nukman pula menerima wang saku sebanyak  $\text{RM}(k + 5)^2$  untuk  $(k^2 - 5^2)$  hari. Hitung hasil darab wang saku harian Fateh dan Nukman.

*Fateh received pocket money of  $\text{RM}(k^2 - 25)$  for  $(k + 5)$  days. Nukman received pocket money of  $\text{RM}(k + 5)^2$  for  $(k^2 - 5^2)$  days. Calculate the product of Fateh and Nukman's daily pocket money.*

- A  $\text{RM}(k + 5)$   
B  $\text{RM}(k - 5)$   
C  $\text{RM}(k^2 - 5)$   
D  $\text{RM}(k^2 - 25)$
- 21 Senaraikan semua integer  $x$  yang memuaskan ketaksamaan linear  $5 - 2x \leq 7$  dan  $5(x - 3) < x + 5$ .

*List all the integers  $x$  that satisfy the inequalities  $5 - 2x \leq 7$  and  $5(x - 3) < x + 5$ .*

- A 0, 1, 2, 3, 4  
B 0, 1, 2, 3, 4, 5  
C -1, 0, 1, 2, 3, 4  
D -1, 0, 1, 2, 3, 4, 5

22 Jadual 2 menunjukkan skor yang diperoleh dalam suatu pertandingan.

*Table 2 shows the scores obtained in a competition.*

<b>Skor</b> <i>Score</i>	0	1	2	3	4	5
<b>Kekerapan</b> <i>Frequency</i>	3	4	7	6	$x$	2

Jadual 2

*Table 2*

Diberi median ialah 3. Antara berikut, yang manakah nilai yang mungkin bagi  $x$ ?

*Given the median is 3. Which of the following is the possible value of  $x$ ?*

- A 3
- B 4
- C 6
- D 7

- 23 Hashim telah membawa sebakul durian ke sebuah gerai untuk dijual. Jisim bagi setiap durian ditunjukkan dalam Jadual 3.

*Hashim sent a basket of durians to a stall to sell. The mass of each durian is shown in the table 3.*

<b>Jisim (kg)</b> <b>Mass (kg)</b>	<b>Kekerapan</b> <b>Frequency</b>	<b>Kekerapan longgokan</b> <b>Cumulative Frequency</b>
1.0 – 1.4	3	3
1.5 – 1.9	7	10
2.0 – 2.4	<b><i>P</i></b>	25
2.5 – 2.9	10	<b><i>Q</i></b>
3.0 – 3.4	5	40

Jadual 3

Table 3

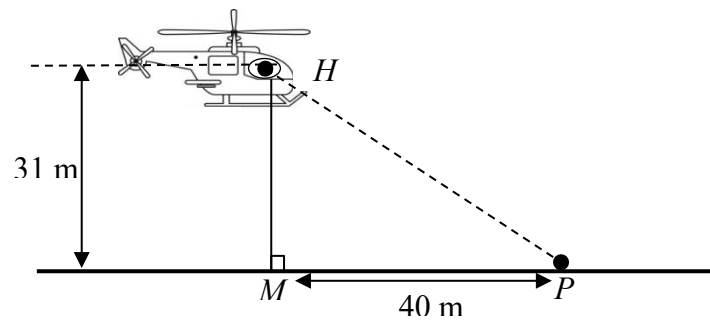
Hitung  $Q - P$ .

*Calculate  $Q - P$ .*

- A 20
- B 25
- C 30
- D 35

- 24 Rajah 12 menunjukkan titik  $H$  pada sebuah helikopter.  $M$  dan  $P$  ialah dua titik pada satah mengufuk.

*Diagram 12 shows a point  $H$  on the helicopter.  $M$  and  $P$  are two points on the horizontal ground.*



Rajah 12  
Diagram 12

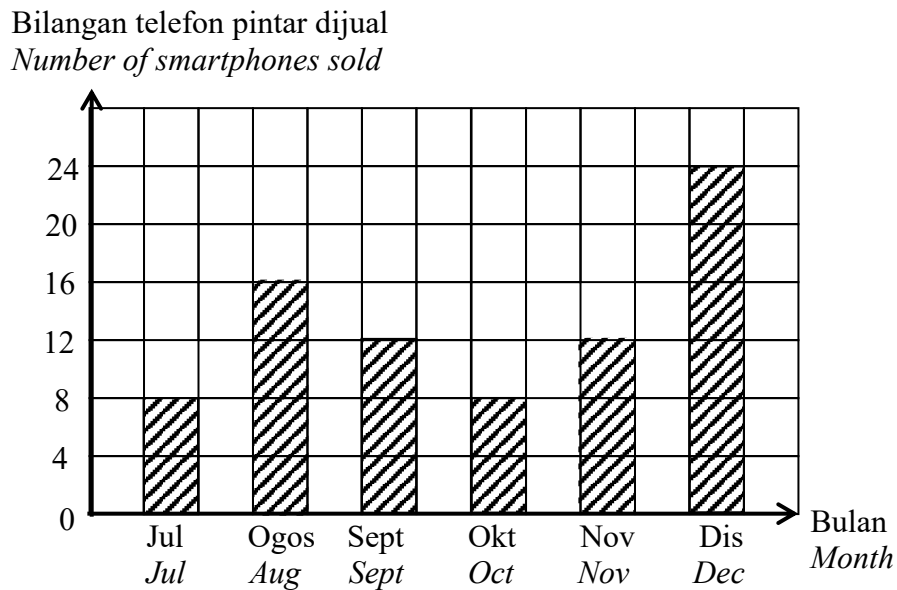
Hitung sudut tunduk titik  $P$  dari titik  $H$ .

*Calculate the angle of depression of point  $P$  from point  $H$ .*

- A  $37^\circ 47'$
- B  $39^\circ 12'$
- C  $50^\circ 48'$
- D  $52^\circ 13'$

- 25 Rajah 13 ialah carta palang yang menunjukkan bilangan telefon pintar yang dijual oleh Daniel pada bulan Julai hingga Disember 2022.

*Diagram 13 is a bar chart showing the number of smartphones sold by Daniel from July to December 2022.*



Rajah 13  
Diagram 13

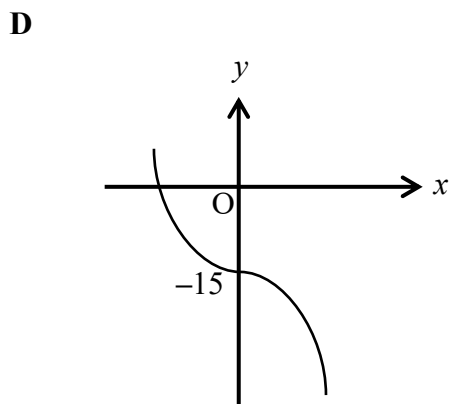
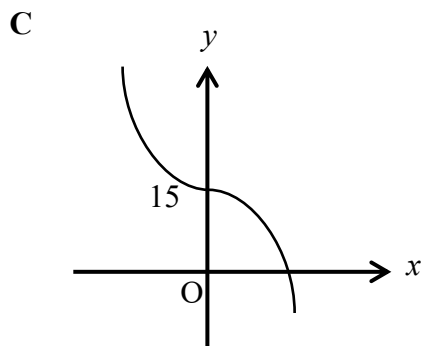
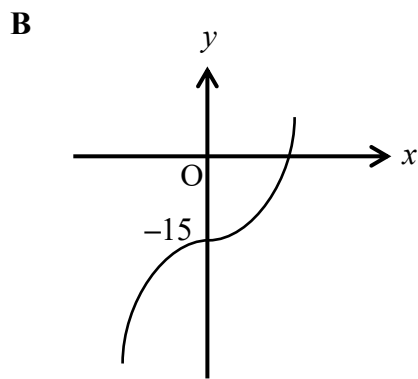
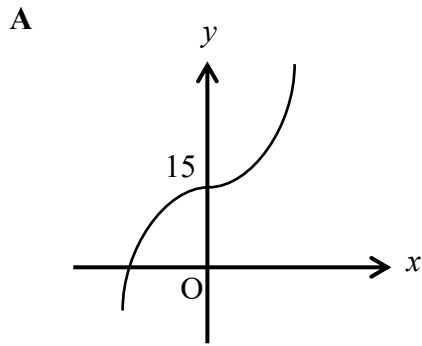
Bilangan telefon pintar yang dijual pada bulan Julai hingga Disember adalah 2.5% kurang daripada bilangan telefon pintar yang dijual pada bulan Januari hingga Jun. Keuntungan yang diperoleh Daniel bagi sebuah telefon pintar ialah RM350. Hitungkan jumlah keuntungan yang diperoleh Daniel dalam tahun itu.

*The number of smartphones sold from July to December is 2.5% less than the number of smartphones sold from January to June. The profit earned by Daniel for each smartphone sold was RM350. Calculate the total profit earned by Daniel in that year.*

- A RM27 300
- B RM28 000
- C RM55 300
- D RM56 700

26 Antara graf yang berikut, manakah mewakili  $y = 15 - 2x^3$ ?

*Which of the following graphs represents  $y = 15 - 2x^3$ ?*





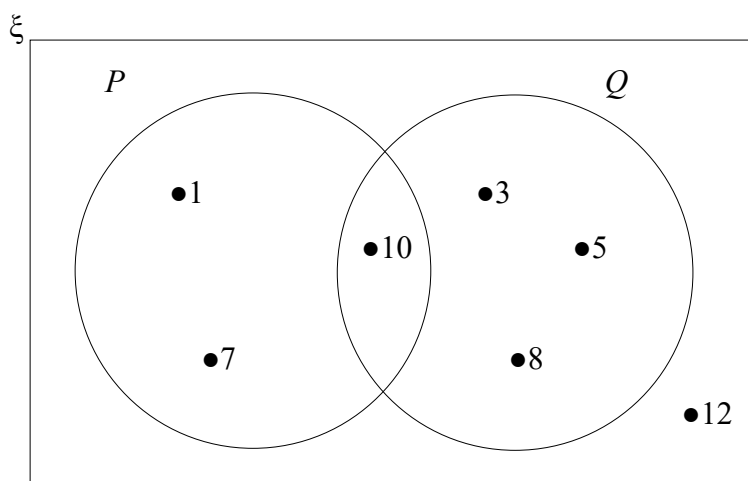
- 27 Salah satu faktor bagi  $1 - 16x^2$  ialah

*One of the factors of  $1 - 16x^2$  is*

- A  $1 - 6x$
- B  $1 + 16x$
- C  $1 + 4x$
- D  $4x - 1$

- 28 Rajah 14 di bawah ialah suatu gambar rajah Venn yang menunjukkan unsur bagi set P, set Q dan set semesta  $\xi$ .

*The diagram 14 below is a Venn diagram showing the elements of set P, set Q and the universal set  $\xi$ .*



Rajah 14  
Diagram 14

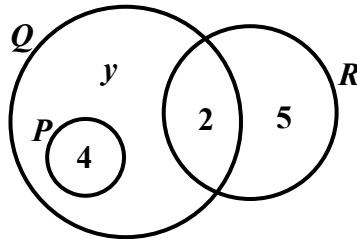
Senaraikan semua unsur bagi set P'.

*List down all the elements of set P'.*

- A  $\{1, 7\}$
- B  $\{1, 7, 10\}$
- C  $\{3, 5, 8\}$
- D  $\{3, 5, 8, 12\}$

- 29 Rajah 15 ialah gambar rajah Venn yang menunjukkan bilangan unsur dalam set  $P$ , set  $Q$  dan set  $R$ .

*Diagram 15 is a Venn diagram showing the number of elements in Set  $P$ ,  $Q$  and  $R$ .*



Rajah 15  
Diagram 15

Diberi bahawa set semesta  $\xi = P \cup Q \cup R$  dan  $n(\xi) = 19$ .

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

*Given that universal set  $\xi = P \cup Q \cup R$  and  $n(\xi) = 19$ .*

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

- A 8
- B 10
- C 12
- D 14

- 30 Pendapatan bercukai Nazim pada tahun 2020 ialah RM48 850. Beliau telah membayar zakat berjumlah RM200 pada tahun tersebut. Jadual 4 menunjukkan kadar cukai pendapatan individu untuk pendapatan bercukai antara RM35 001 dengan RM50 000. *Nazim chargeable income in 2020 was RM48 850. He paid zakat amounting to RM200 in that year. Table 3 shows individual income tax rate for chargeable income between RM35 001 and RM50 000.*

<b>Banjaran pendapatan bercukai</b> <i>Chargeable income</i> <b>(RM)</b>	<b>Pengiraan</b> <i>Calculations</i> <b>(RM)</b>	<b>Kadar</b> <i>Rate</i> <b>(%)</b>	<b>Cukai</b> <i>Tax</i> <b>(RM)</b>
35 001 – 50 000	35 000 pertama <i>On the first 35 000</i> 15 000 berikutnya <i>Next 15 000</i>	8	600 1200

Jadual 4

Table 4

Hitung cukai pendapatan yang perlu dibayar oleh Nazim.

*Calculate the income tax to be paid by Nazim.*

- A RM1 492
- B RM1 692
- C RM1 508
- D RM1 708

- 31** Pendapatan aktif Jasmin ialah RM3 500. Perbelanjaan tetap dan perbelanjaan tidak tetapnya masing-masing ialah RM3 800 dan RM1 200. Berapakah pendapatan pasif Jasmin supaya aliran tunai itu adalah positif?

*Jasmin's active income is RM3 500. Her fixed expenses and variable expenses are RM3 800 and RM1 200 respectively. How much is Jasmin's passive income so that the cash flow is positive?*

- A** RM1 000
- B** RM1 200
- C** RM1 500
- D** RM2 000

- 32** Shahifull menyimpan sebanyak RM6 500 di sebuah bank dengan kadar faedah mudah  $x\%$  setahun. Jumlah simpanan Shahifull pada akhir tahun keempat adalah sebanyak RM7 410. Hitung nilai  $x$ .

*Shahifull deposits RM6 500 in a bank which pays a simple interest rate of  $x\%$  per annum. The total saving of Shahifull at the end of the fourth year is RM7 410. Calculate the value of  $x$ .*

- A** 2.8
- B** 3.0
- C** 3.5
- D** 4.0

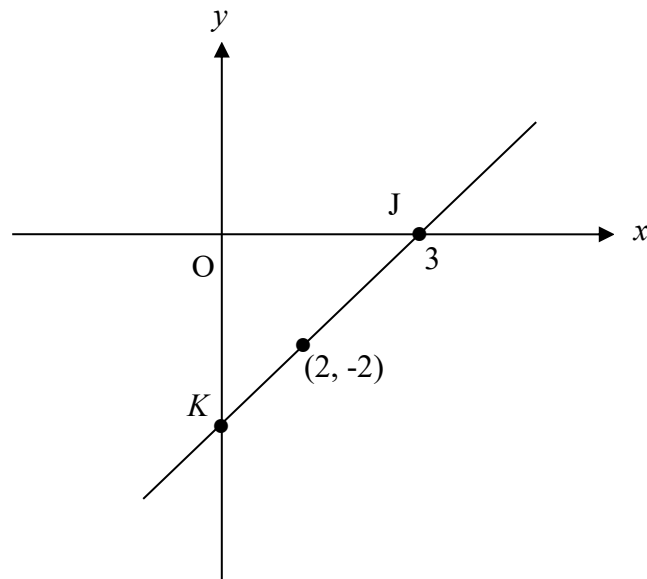
- 33** Jason ingin membeli insurans hayat dengan nilai muka sebanyak RM150 000. Kadar premium tahunan bagi setiap RM1 000 nilai muka yang ditawarkan kepada Jason ialah RM2.12. Berapakah premium bulanan yang perlu dibayar oleh Jason?

*Jason wants to buy a life insurance with a face value of RM150 000. The annual premium rate per RM1 000 of face value offered to Jason is RM2.12. What is the monthly premium needs to be paid by Jason?*

- A** RM26.50
- B** RM73.58
- C** RM150.00
- D** RM318.00

34 Rajah 16 menunjukkan garis lurus  $JK$ .

*Diagram 16 shows a straight line  $JK$ .*



Rajah 16  
Diagram 16

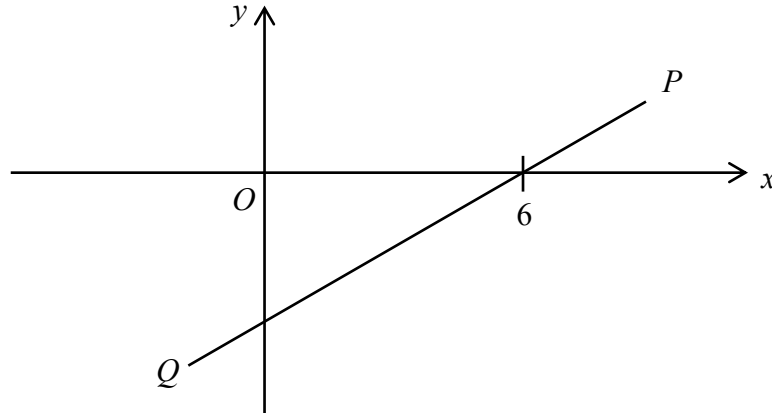
Cari pintasan-y bagi garis lurus  $JK$ .

*Find the y-intercept of straight line  $JK$ .*

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

- 35 Dalam Rajah 17,  $PQ$  ialah garis lurus dengan kecerunan  $\frac{1}{3}$ .

*In Diagram 17,  $PQ$  is a straight line with gradient  $\frac{1}{3}$*



Rajah 17

Diagram 17

Carikan persamaan bagi garis lurus  $PQ$ .

*Find the equation of the straight line  $PQ$ .*

- A**  $y = \frac{1}{3}x + 6$
- B**  $y = \frac{1}{3}x - 6$
- C**  $y = \frac{1}{3}x + 2$
- D**  $y = \frac{1}{3}x - 2$

- 36 Humaira akan mengambil ujian dalam talian pada minggu hadapan. Kebarangkalian Humaira akan lulus ujian dalam talian ialah 0.7. Hitung kebarangkalian jika dia lulus ujian dalam talian tersebut setelah 3 kali percubaan.

*Humaira will take the online test next week. The probability that Humaira will pass the online test is 0.7. Calculate the probability if she passes the online test after 3 attempts.*

- A 0.910  
B 0.343  
C 0.189  
D 0.063
- 37 Iskandar membawa 7 biji guli biru, 5 biji guli kuning dan 6 biji guli merah dalam satu permainan. Dua biji guli diambil secara rawak dalam permainan itu. Cari kebarangkalian bahawa kedua-dua guli itu mempunyai warna yang sama.

*Iskandar brings 7 blue marbles, 5 yellow marbles and 6 red marbles in a game. Two marbles are taken at random in that game. Find the probability that the two marbles are the same colour.*

- A  $\frac{23}{81}$   
B  $\frac{46}{153}$   
C  $\frac{55}{162}$   
D  $\frac{55}{153}$

38 Jadual 5 menunjukkan beberapa nilai pembolehubah,  $t$ ,  $h$  dan  $w$ .

*Table 5 shows some values of the variables  $t$ ,  $h$  and  $w$ .*

$w$	3	4
$t$	3	8
$h$	9	$x$

Jadual 5

Table 5

Diberi bahawa  $w \propto \frac{t}{\sqrt{h}}$ , hitungkan nilai  $x$ .

*Given that  $w \propto \frac{t}{\sqrt{h}}$ , calculate the value of  $x$ .*

- A 3
- B 6
- C 12
- D 36

39  $\frac{1}{4} \begin{pmatrix} 8 & -4 \\ -12 & 16 \end{pmatrix} - \begin{pmatrix} 2 & -2 \\ -4 & 1 \end{pmatrix} + \begin{pmatrix} -1 & 2 \\ -3 & -7 \end{pmatrix} =$

- A  $\begin{pmatrix} -1 & 3 \\ -2 & 4 \end{pmatrix}$
- B  $\begin{pmatrix} -1 & 3 \\ 2 & -4 \end{pmatrix}$
- C  $\begin{pmatrix} -1 & 0 \\ -2 & -4 \end{pmatrix}$
- D  $\begin{pmatrix} -1 & 3 \\ -2 & -4 \end{pmatrix}$



40 Diberi bahawa  $\begin{pmatrix} 3 \\ x \end{pmatrix} (y - 13) = \begin{pmatrix} 12 & -39 \\ -20 & 65 \end{pmatrix}$ , cari nilai  $x$  dan  $y$ .

Given that  $\begin{pmatrix} 3 \\ x \end{pmatrix} (y - 13) = \begin{pmatrix} 12 & -39 \\ -20 & 65 \end{pmatrix}$ , find the value of  $x$  and  $y$ .

A  $x = 4, y = -5$

B  $x = 5, y = \frac{1}{4}$

C  $x = -5, y = 4$

D  $x = -5, y = \frac{1}{4}$

**KERTAS SOALAN TAMAT**  
**END OF QUESTION PAPER**

**MAKLUMAT UNTUK CALON**  
**INFORMATION FOR CANDIDATES**

1. Kertas soalan ini mengandungi **40** soalan.  
*This question paper consists of **40** questions.*
2. Jawab **semua** soalan.  
*Answer **all** questions.*
3. Jawab setiap soalan dengan menghitamkan ruangan yang betul pada kertas jawapan objektif.  
*Answer each question by blackening the correct space on the objective answer sheet.*
4. Hitamkan satu ruangan sahaja bagi setiap soalan.  
*Blacken only one space for each question.*
5. Sekiranya anda hendak menukar jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.  
*If you wish to change your answer, erase the blackened mark that you have done. Then blacken the space for the new answer.*
6. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.  
*The diagrams provided in the questions are not drawn to scale unless stated.*
7. Satu senarai rumus ada disediakan.  
*A list of formulae is provided.*
8. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.  
*You may use a non-programmable scientific calculator.*