

1449/1

SULIT



**JABATAN PELAJARAN NEGERI TERENGGANU**

**PEPERIKSAAN OTI 2  
TINGKATAN EMPAT 2011  
MATHEMATICS**

1449/1

Kertas 1  
Oktober/November  
2011  
 $1\frac{1}{4}$  jam

Satu jam lima belas minit

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**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU**

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 belakang kertas soalan ini.*

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Kertas soalan ini mengandungi 26 halaman bercetak dan 2 halaman tidak bercetak

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

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 =  $\frac{\text{distance travelled}}{\text{time taken}}$**

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

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

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

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

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

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

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

**SHAPES AND SPACE  
BENTUK DAN RUANG**

- 1 Area of trapezium =  $\frac{1}{2} \times \text{sum of parallel sides} \times \text{height}$   
*Luas trapezium =  $\frac{1}{2} \times \text{hasil tambah dua sisi selari} \times \text{tinggi}$*
- 2 Circumference of circle =  $\pi d = 2\pi r$   
*Lilitan bulatan =  $\pi d = 2\pi r$*
- 3 Area of circle =  $\pi r^2$   
*Luas bulatan =  $\pi r^2$*
- 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  
*Isipadu prisma tegak = luas keratan rentas  $\times$  panjang*
- 7 Volume of cylinder =  $\pi r^2 h$   
*Isipadu silinder =  $\pi r^2 h$*
- 8 Volume of cone =  $\frac{1}{3} \pi r^2 h$   
*Isipadu kon =  $\frac{1}{3} \pi r^2 h$*
- 9 Volume of sphere =  $\frac{4}{3} \pi r^3$   
*Isipadu sfera =  $\frac{4}{3} \pi r^3$*
- 10 Volume of right pyramid =  $\frac{1}{3} \times \text{base area} \times \text{height}$   
*Isipadu 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*  
 $= (n - 2) \times 180^\circ$

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

$$\frac{\text{panjang lengkung}}{\text{lilitan bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$$

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

$$\frac{\text{luas sektor}}{\text{luas bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$$

$$14 \quad \text{Scale factor, } k = \frac{PA'}{PA}$$

$$\text{Faktor skala, } k = \frac{PA'}{PA}$$

$$15 \quad \text{Area of image} = k^2 \times \text{area of object}$$

$$\text{Luas imej} = k^2 \times \text{luas objek}$$

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- 1 Round off 0.01863 correct to two significant figures.

*Bundarkan 0.01863 betul kepada dua angka bererti.*

- |   |       |   |       |
|---|-------|---|-------|
| A | 0.01  | B | 0.019 |
| C | 0.018 | D | 0.02  |

- 2 Express 0.00436 in standard form.

*Ungkapkan 0.00436 dalam bentuk piawai.*

- |   |                        |   |                        |
|---|------------------------|---|------------------------|
| A | $0.043 \times 10^{-2}$ | B | $0.436 \times 10^{-3}$ |
| C | $4.36 \times 10^{-3}$  | D | $4.36 \times 10^3$     |

- 3  $3.7 \times 10^5 + 67000 =$

- |   |                    |   |                      |
|---|--------------------|---|----------------------|
| A | $4.37 \times 10^5$ | B | $437 \times 10^{-5}$ |
| C | $4.4 \times 10^6$  | D | $4.4 \times 10^{-6}$ |

- 4 The area of a rectangular a lot of land is  $6.8 \text{ km}^2$ . If the width is 3400 m, calculate the length, in m of the land.

*Luas satu lot tanah yang berbentuk segi empat tepat ialah  $6.8 \text{ km}^2$ . Jika lebarnya ialah 3400 m, hitung panjang, dalam m tanah itu*

- |   |                 |   |                 |
|---|-----------------|---|-----------------|
| A | $2 \times 10^3$ | B | $5 \times 10^3$ |
| C | $2 \times 10^4$ | D | $5 \times 10^4$ |

- 5 In Diagram 1, WXYZ is a rhombus, WYP is a straight line.  
 Dalam Rajah 1, WXYZ ialah sebuah rombus, WYP ialah satu garis lurus.

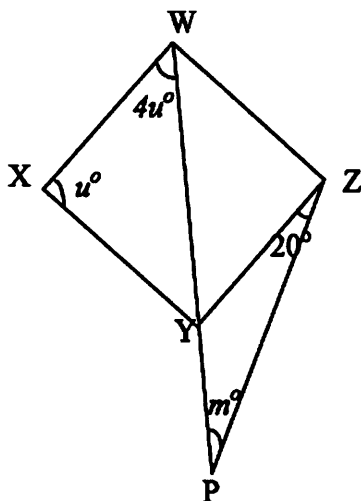


Diagram 1 / Rajah 1

Calculate the value of  $m$ .

Hitung nilai  $m$ .

- |   |            |   |            |
|---|------------|---|------------|
| A | $20^\circ$ | B | $30^\circ$ |
| C | $40^\circ$ | D | $60^\circ$ |
- 6 Diagram 2 shows a regular hexagon PQRSTU and an equilateral triangle MNS  
 Rajah 2 menunjukkan sebuah heksagon sekata PQRSTU dan sebuah segitiga sama sisi MNS

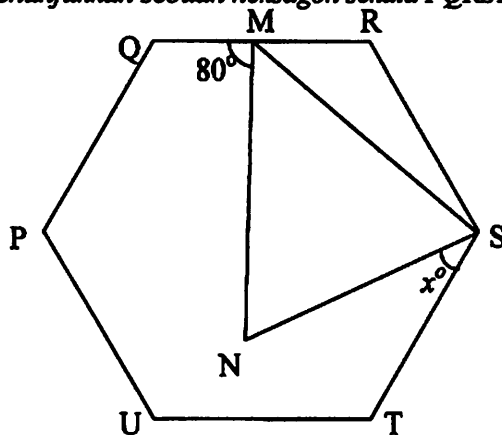


Diagram 2 / Rajah 2

Find the value of  $x$

Cari nilai  $x$

- |   |    |   |    |
|---|----|---|----|
| A | 40 | B | 50 |
| C | 60 | D | 80 |

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- 7 In Diagram 3 below, DEF is a tangent to the circle at the point E.  
 Dalam rajah 3 di bawah, DEF adalah tangen kepada bulatan pada titik E.

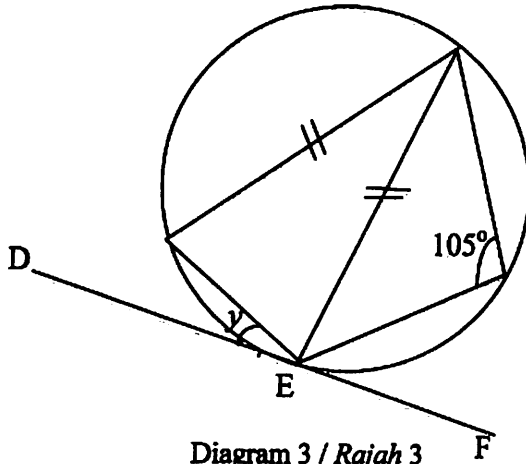


Diagram 3 / Rajah 3

Find the value of  $y$ .

Cari nilai  $y$

- |   |            |   |            |
|---|------------|---|------------|
| A | $20^\circ$ | B | $30^\circ$ |
| C | $35^\circ$ | D | $40^\circ$ |

8. In Diagram, 4 TRQ is a tangent to the circle centre O at the point R.  
 Dalam Rajah 4, TRQ adalah tangen kepada bulatan yang berpusat O di titik R.

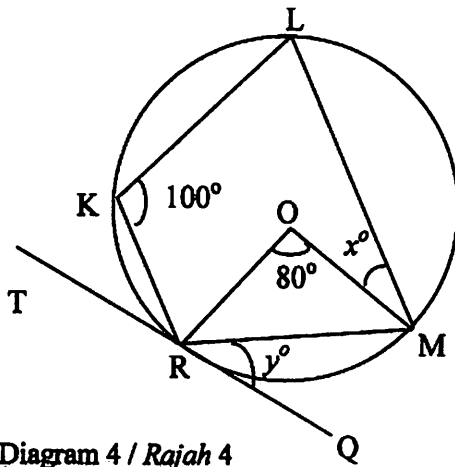


Diagram 4 / Rajah 4

Calculate the value of  $x + y$

Hitung nilai  $x + y$

- |   |            |   |             |
|---|------------|---|-------------|
| A | $50^\circ$ | B | $90^\circ$  |
| C | $70^\circ$ | D | $120^\circ$ |

9 Diagram 5 below shows five triangles drawn on square grids.

*Rajah 5 di bawah menunjukkan lima segitiga yang dilukis pada grid segiempat sama.*

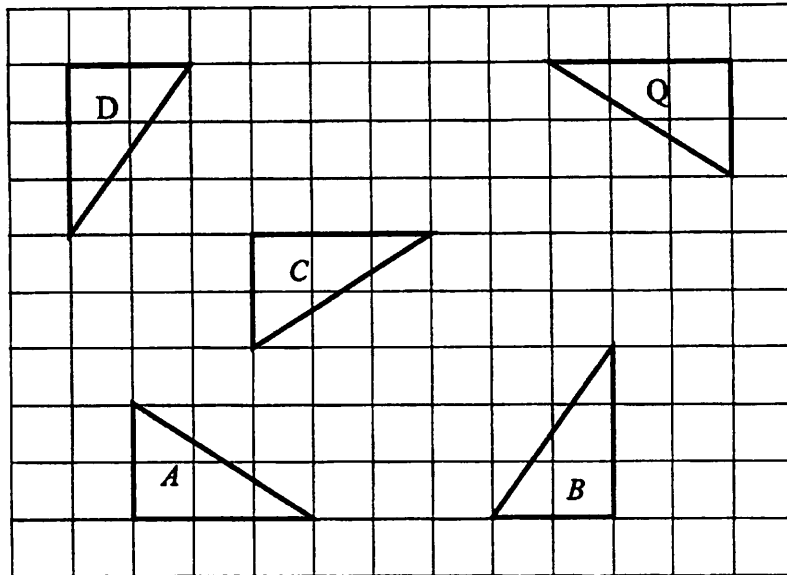


Diagram 5 / Rajah 5

Which of the triangles, A, B, C or D is not an image of triangle Q under a rotation?

*Antara segitiga, A, B, C atau D yang manakah bukan imej bagi segitiga Q di bawah suatu putaran?*



10 In Diagram 6, rhombuses PQRS and TUVW drawn on square grids.

*Dalam Rajah 6, rombus PQRS dan TUVW dilukis pada grid segiempat sama.*

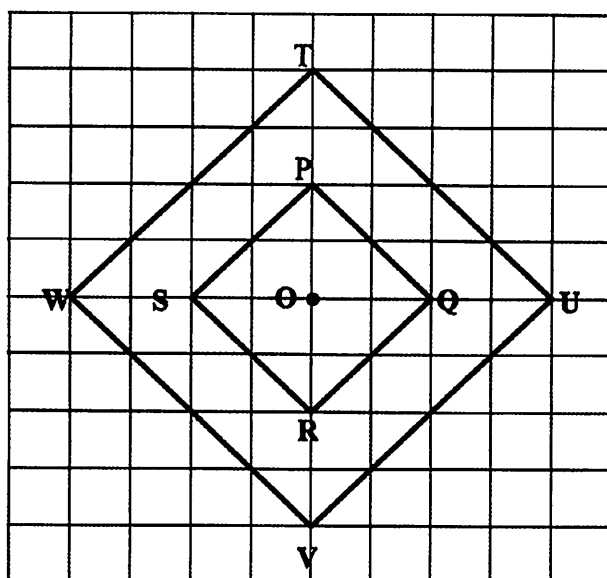


Diagram 6 / Rajah 6

TUVW is the image of PQRS under an enlargement with centre O. Find the scale factor of the enlargement

*TUVW adalah imej bagi PQRS di bawah satu pembesaran dengan pusat O. Carikan faktor skala pembesaran.*

A  $\frac{1}{3}$

B  $\frac{1}{2}$

C 3

D 2

11. In Diagram 7, EGH is a straight line with  $EG = GH$ . Given that  $\cos x = \frac{3}{5}$

Dalam rajah 7, EGH ialah garis lurus dengan  $EG = GH$ . Diberi bahawa  $\cos x = \frac{3}{5}$

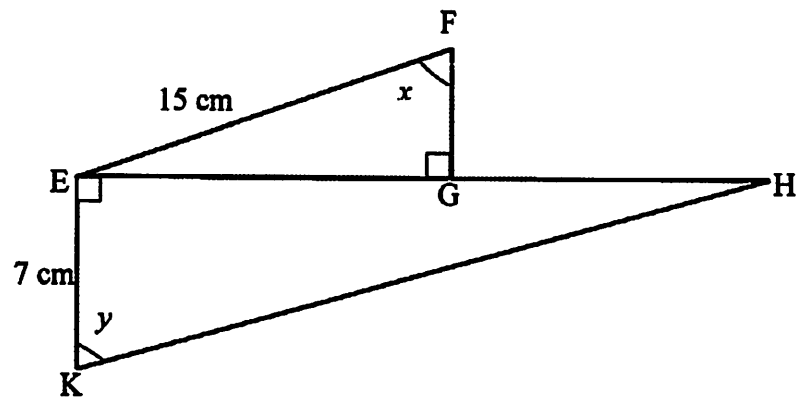


Diagram 7 / Rajah 7

Find the value of  $\sin y^\circ$

Cari nilai  $\sin y^\circ$

A.  $\frac{7}{12}$

B.  $\frac{12}{17}$

C.  $\frac{12}{25}$

D.  $\frac{24}{25}$

12. In Diagram 8, QRS is a straight line.

*Dalam rajah 8, QRS ialah garis lurus*

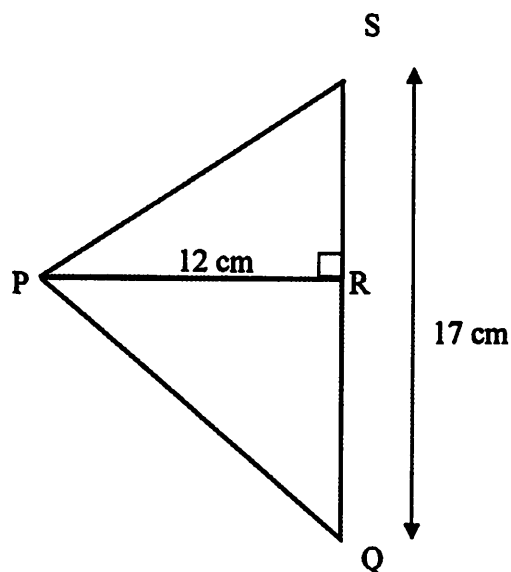


Diagram 8 / Rajah 8

Given that  $\angle RPQ = \angle PQR$ , then  $\cos \angle PSR =$

*Diberi bahawa  $\angle RPQ = \angle PQR$ , maka kos  $\angle PSR =$*

A.  $\frac{1}{2}$

B.  $\frac{1}{3}$

C.  $\frac{5}{12}$

D.  $\frac{5}{13}$

13. In Diagram 9, BCD is a straight line.

*Dalam rajah 9, BCD ialah garis lurus.*

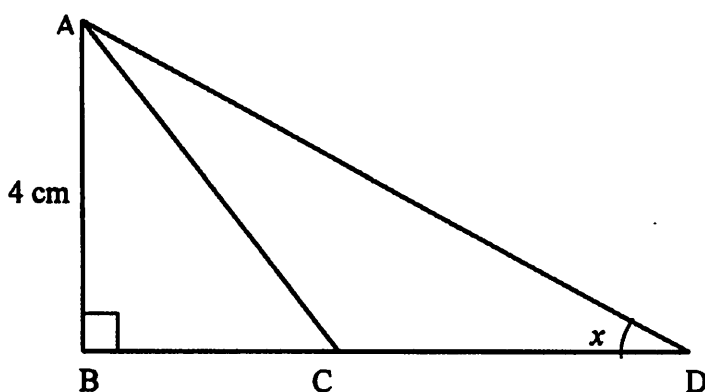


Diagram 9 / Rajah 9

Given that  $AC = CD = 5$  cm, then  $\tan x =$

*Diberi bahawa  $AC = CD = 5$  cm, maka  $\tan x =$*

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

14. Diagram 10 shows a right prism with a horizontal rectangular base PQRS.

*Rajah 10 menunjukkan sebuah prisma tegak dengan tapak segi empat tepat PQRS.*

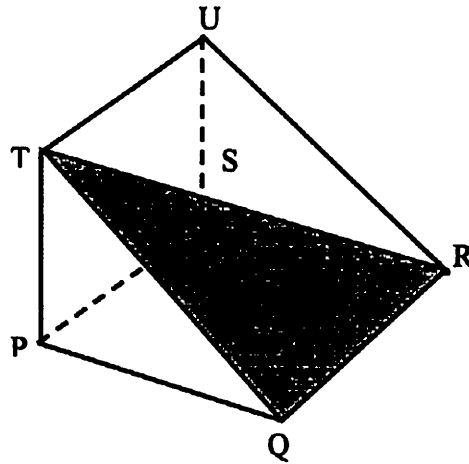


Diagram 10 / Rajah 10

Name the angle between the plane QRT and the plane PQRS.

*Namakan sudut di antara satah QRT dengan satah PQRS.*

- |    |              |    |              |
|----|--------------|----|--------------|
| A. | $\angle TRP$ | B. | $\angle TQP$ |
| C. | $\angle TQR$ | D. | $\angle TRU$ |

15. In Diagram 11, QR and STU are two vertical pole on a horizontal plane.

*Dalam rajah 11, QR and STU ialah dua batang tiang tegak yang terletak pada satu permukaan mengufuk.*

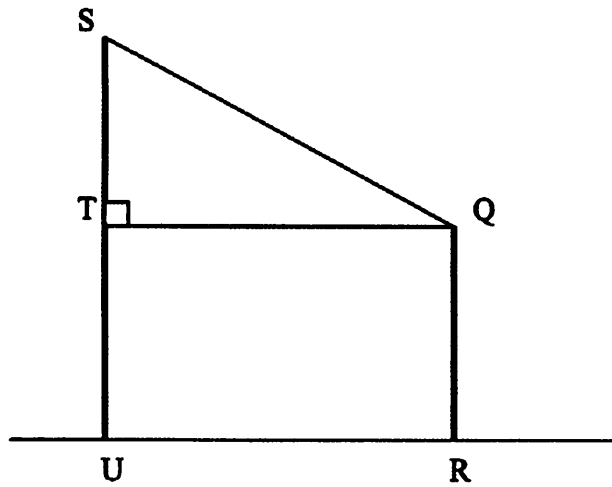


Diagram 11 / Rajah 11

The angle of depression of point Q from point S is equal to

*Sudut tunduk titik Q dari titik S adalah sama dengan*

- |    |              |    |              |
|----|--------------|----|--------------|
| A. | $\angle SQR$ | B. | $\angle SQT$ |
| C. | $\angle SRT$ | D. | $\angle SRU$ |



18. It is given that  $\sin \theta = -0.8358$  and  $90^\circ < \theta < 270^\circ$ , find the value of  $\theta$ .

*Diberi bahawa  $\sin \theta = -0.8358$  dan  $90^\circ < \theta < 270^\circ$ , cari nilai bagi  $\theta$ .*

- A.  $123^\circ 18'$                       B.  $146^\circ 42'$   
 C.  $213^\circ 18'$                       D.  $236^\circ 42'$

19 In Diagram 13, PQR is a straight line. Given that  $\sin \angle PRS = \frac{4}{5}$  and Q is the midpoint of PR.

*Dalam rajah 13, PQR ialah garis lurus. Diberi bahawa  $\sin \angle PRS = \frac{4}{5}$  dan Q ialah titik tengah bagi PR.*

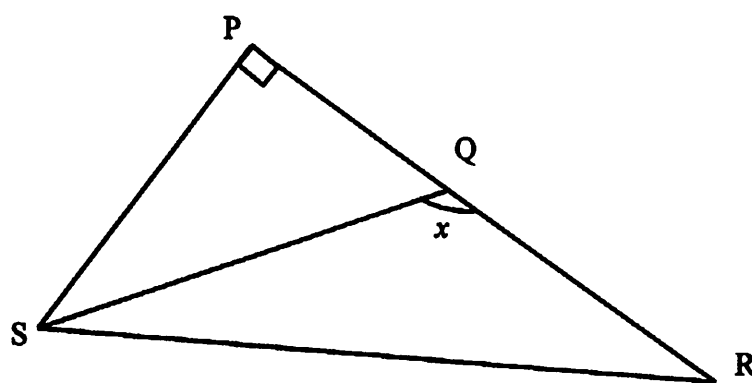


Diagram 13 / Rajah 13

Find the value of  $\tan x^\circ$ .  
 Cari nilai bagi  $\tan x^\circ$ .

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



20 Diagram 14 shows a unit circle with the centre  $O$ .

*Rajah 14 menunjukkan sebuah bulatan unit berpusat  $O$ .*

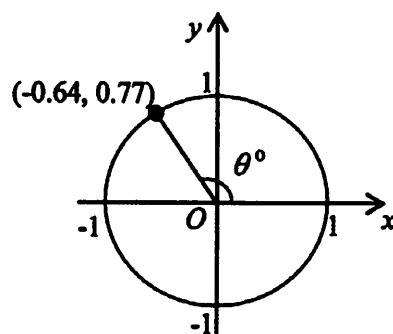


Diagram 14 / *Rajah 14*

The value of  $\tan \theta^\circ$  is

*Nilai bagi  $\tan \theta^\circ$  ialah*

A 0.77

B -0.64

C -1.20

D 1.20

21  $(x + y)^2 - (x^2 + y^2) =$

A 0

B  $2y^2$

C  $2xy$

D  $-2xy$

22  $3(m - 1)^2 - (2m - 1)^2 =$

A  $m^2 + 2m + 1$

B  $m^2 - 2m - 1$

C  $-m^2 - 2m + 2$

D  $-m^2 - 2m + 4$

- 23 Given  $v^2 = 25 - 2as$ . Express  $s$  in term of  $a$  and  $v$   
 Diberi  $v^2 = 25 - 2as$ . Ungkapkan  $s$  dalam sebutan  $a$  dan  $v$

A  $\frac{25+v^2}{2a}$

B  $\frac{25-v^2}{2a}$

C  $\frac{v^2-25}{2a}$

D  $\frac{2(v^2+25)}{a}$

- 24 Given  $\frac{x}{3} - \frac{y}{4} = 1$ . Express  $y$  in term of  $x$   
 Diberi  $\frac{x}{3} - \frac{y}{4} = 1$ . Ungkapkan  $y$  in term of  $x$

A  $\frac{4}{3}x - 4$

B  $\frac{4}{3}x + 4$

C  $\frac{3}{4}x + \frac{1}{3}$

D  $\frac{3}{4}x + 1$

- 25 Given  $\frac{3m-1}{2} = 2m-3$ , then  $m =$   
 Diberi  $\frac{3m-1}{2} = 2m-3$ , maka  $m =$

A -2

B 2

C 4

D 5

- 26 Given  $\frac{(3^3)^2}{81} = 3^p$ , then  $p$  is  
 Diberi  $\frac{(3^3)^2}{81} = 3^p$ , maka  $p$  ialah

A -2

B 2

C 3

D 4

27 Simplify  $(m^2n^3)^3 + m^{-3}n$   
Ringkaskan  $(m^2n^3)^3 + m^{-3}n$

A  $m^3n^8$

B  $m^9n^{10}$

C  $m^9n^5$

D  $m^9n^8$

28 All integers  $x$  that satisfy both inequalities  $x - 1 \geq -2$  and  $\frac{x}{3} + 3 < 4$  are

Semua integer  $x$  yang memuaskan kedua-dua ketaksamaan  $x - 1 \geq -2$  dan  $\frac{x}{3} + 3 < 4$  adalah

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

B  $-1, 0, 1, 2$

C  $0, 1, 2, 3$

D  $0, 1, 2$

29 The solution for  $\frac{2k}{3} - 1 \geq 2 + k$  is

Penyelesaian bagi  $\frac{2k}{3} - 1 \geq 2 + k$  ialah

A  $k \geq -9$

B  $k \leq -9$

C  $k \leq -7$

D  $k \geq -7$

- 30 The pie chart in Diagram 15 shows the number of packets for three types of bread produced by a bakery on a particular day. The number of packets for bread P is 120.

*Carta pai dalam Rajah 15 menunjukkan bilangan bungkusan roti yang dihasilkan oleh sebuah kedai roti pada suatu hari tertentu. Bilangan bungkusan bagi roti P ialah 120*

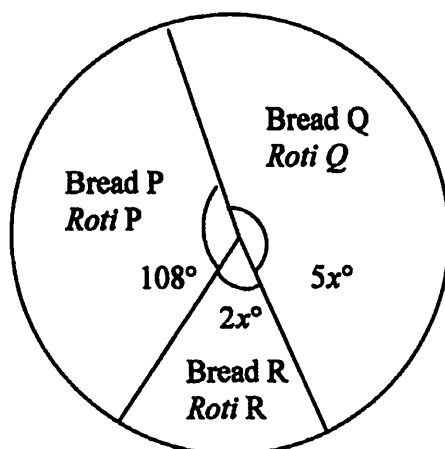


Diagram 15 / Rajah 15

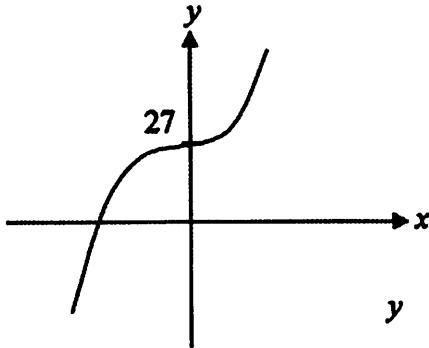
Calculate the number of packets of all breads produced.  
*Hitung bilangan bungkusan semua roti yang dihasilkan.*

- |          |            |          |            |
|----------|------------|----------|------------|
| <b>A</b> | <b>400</b> | <b>B</b> | <b>360</b> |
| <b>C</b> | <b>200</b> | <b>D</b> | <b>160</b> |

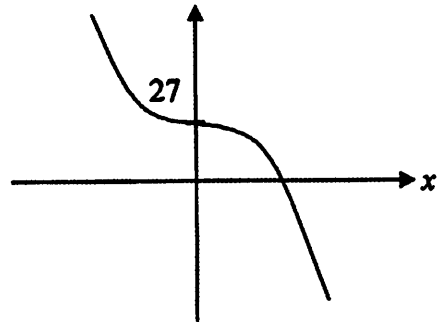


- 33 Which one of the following graphs represents  $y = 27 - x^3$ ?  
 Antara graf berikut yang manakah mewakili graf  $y = 27 - x^3$ ?

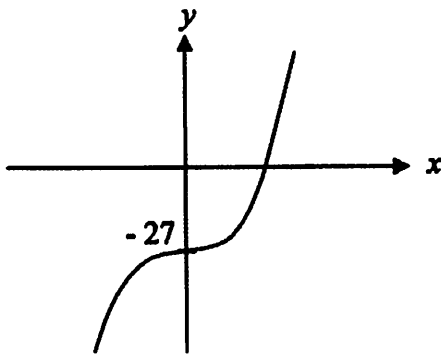
A



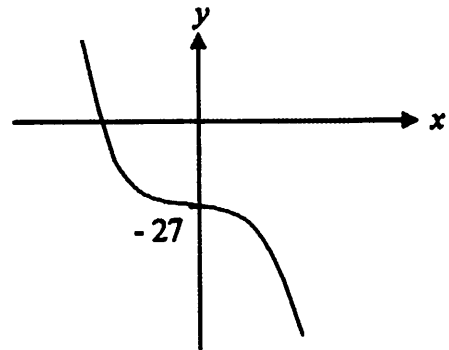
B



C



D



- 34 It is given that the universal set  $\xi = P \cup Q$ , set  $P = \{2, 3, 5, x\}$  and set  $Q = \{1, 4, 5, x, 6\}$ .  
 Diberi bahawa set semesta  $\xi = P \cup Q$ , set  $P = \{2, 3, 5, x\}$  dan set  $Q = \{1, 4, 5, x, 6\}$ .

Find the value of  $n(P \cup Q)$ .

Cari nilai  $n(P \cup Q)$ .

- |          |          |          |          |
|----------|----------|----------|----------|
| <b>A</b> | <b>2</b> | <b>B</b> | <b>5</b> |
| <b>C</b> | <b>7</b> | <b>D</b> | <b>9</b> |

35 Diagram 17 is a Venn diagram which shows set  $X$ , set  $Y$  and set  $Z$ . The area which represents set  $X \cap (Y \cup Z)$  is

*Rajah 17 ialah gambar rajah Venn yang menunjukkan set  $X$ , set  $Y$  dan set  $Z$ .*

*Kawasan yang mewakili set  $X \cap (Y \cup Z)$  ialah*

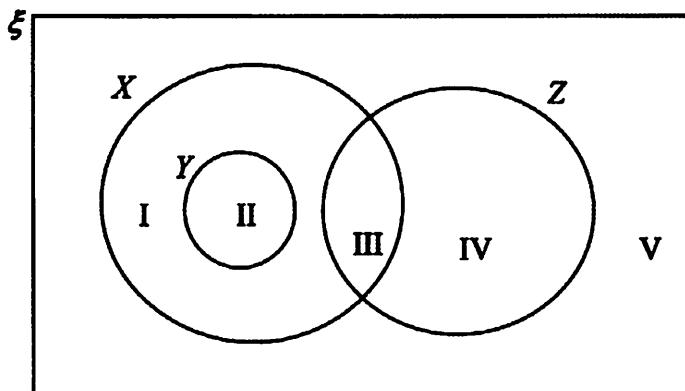
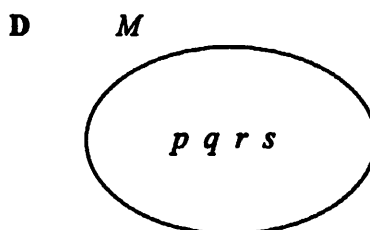
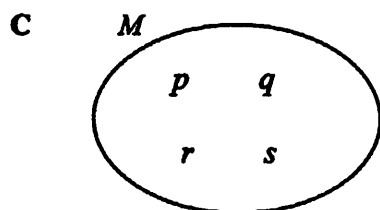
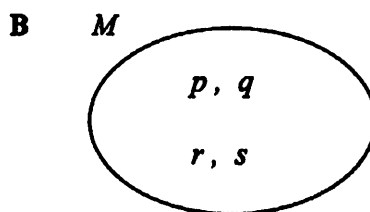
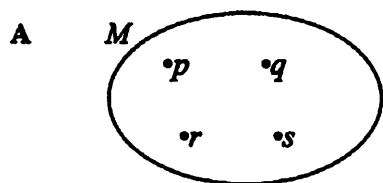


Diagram 17 / Rajah 17

- |   |           |   |            |
|---|-----------|---|------------|
| A | II and IV | B | III and IV |
| C | I and IV  | D | II and III |

36 Which of the following Venn Diagram represents  $M = \{p, q, r, s\}$  ?

*Antara berikut, gambar Rajah Venn yang manakah mewakili set  $M = \{p, q, r, s\}$  ?*



- 37 Diagram 18 shows two straight lines,  $PQ$  and  $QR$ , on a Cartesian plane. Given  $PQ$  is 15 unit and the  $x$ -intercept of  $PQ$  is  $-9$

*Rajah 18 menunjukkan dua garis lurus,  $PQ$  dan  $QR$ , pada satah Cartesian. Diberi  $PQ$  ialah 15 unit dan pintasan  $-x$  bagi  $PQ$  ialah  $-9$*

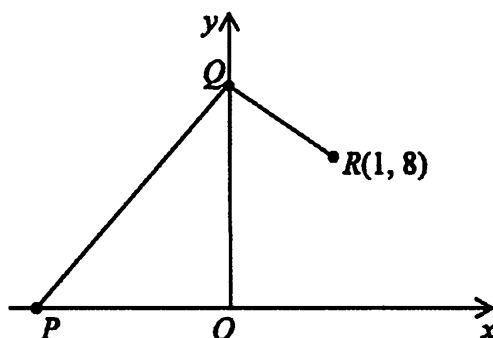


Diagram 18 / Rajah 18

Find the gradient of  $QR$ .

*Cari kecerunan bagi  $QR$ .*

- |   |    |   |    |
|---|----|---|----|
| A | -1 | B | -4 |
| C | -7 | D | -8 |
- 38 In Diagram 19,  $TV$  is a straight line. Given the gradient of the straight line  $TV$  is  $-\frac{2}{3}$

*Dalam Rajah 19,  $TV$  ialah garis lurus. Diberi kecerunan  $TV$  ialah  $-\frac{2}{3}$ .*

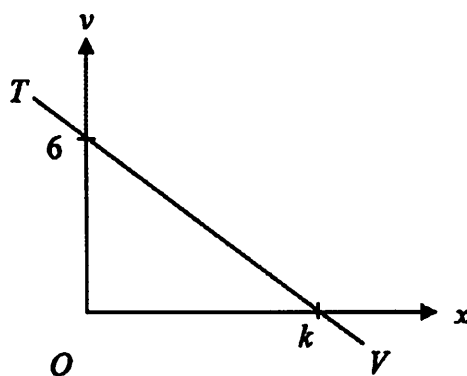


Diagram 19 / Rajah 19

Find the value of  $k$ .

*Cari nilai  $k$ .*

- |   |   |   |   |
|---|---|---|---|
| A | 3 | B | 4 |
| C | 6 | D | 9 |





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**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. Each question is followed by four alternative answers, A, B, C or D. For each question, choose one answer only. Blacken your answer on the objective answer sheet provided.  
*Tiap-tiap soalan diikuti oleh empat pilihan jawapan, iaitu A, B, C dan D. Bagi setiap soalan, pilih satu jawapan sahaja. Hitamkan jawapan anda pada kertas jawapan objektif yang disediakan.*
4. If you wish to change your answer, erase the blackened mark that you have made. Then blacken the new answer.  
*Jika anda hendak menukar jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.*
5. The diagrams in the questions provided are not drawn to scale unless stated.  
*Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.*
6. A list of formulae is provided on pages 2 to 4.  
*Satu senarai rumus disediakan di halaman 2 hingga 4.*
7. A booklet of four-figure mathematical tables is provided.  
*Sebuah buku sifir matematik empat angka disediakan.*
8. You may use a non-programmable scientific calculator.  
*Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.*