

SULIT



**SEKOLAH BERASRAMA PENUH  
BAHAGIAN PENGURUSAN  
SEKOLAH BERASRAMA PENUH / KLUSTER  
KEMENTERIAN PELAJARAN MALAYSIA**

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**PEPERIKSAAN PERCUBAAN SELARAS SBP 2008**

**1449/1**

**SIJIL PELAJARAN MALAYSIA**

**MATHEMATICS**

**Kertas 1**

**Ogos**

**1¼ jam**

**Satu jam lima belas minit**

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**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU**

1. Kertas soalan ini adalah dalam Bahasa Inggeris.
2. Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.

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Kertas soalan ini mengandungi 26 halaman bercetak.

### **MATHEMATICAL FORMULAE**

*The following formulae may be helpful in answering the questions. The symbols given are the ones commonly used.*

### **RELATIONS**

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

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

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

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

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

10 Pythagoras Theorem

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

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

## SHAPES AND SPACE

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

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

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

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

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- 5 Surface area of sphere =  $4\pi r^2$
- 6 Volume of right prism = cross sectional area  $\times$  length
- 7 Volume of cylinder =  $\pi r^2 h$
- 8 Volume of cone =  $\frac{1}{3} \pi r^2 h$
- 9 Volume of sphere =  $\frac{4}{3} \pi r^3$
- 10 Volume of right pyramid =  $\frac{1}{3} \times$  base area  $\times$  height
- 11 Sum of interior angles of a polygon =  $(n - 2) \times 180^\circ$
- 12 
$$\frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$
- 13 
$$\frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$
- 14 Scale factor,  $k = \frac{PA'}{PA}$
- 15 Area of image =  $k^2 \times$  area of object

Answer **all** questions.

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**1** Round off 0.007845 correct to three significant

- A** 0.008
- B** 0.0078
- C** 0.00784
- D** 0.00785

**2** Evaluate  $6.31 \times 10^{-7} - 4.6 \times 10^{-8} =$

- A**  $1.71 \times 10^{-8}$
- B**  $1.71 \times 10^{-7}$
- C**  $5.85 \times 10^{-8}$
- D**  $5.85 \times 10^{-7}$

**3** Find the value of  $\frac{7.92 \times 10^{-2}}{(4 \times 10^{-3})^2} =$

- A**  $1.98 \times 10^3$
- B**  $1.98 \times 10^4$
- C**  $4.95 \times 10^3$
- D**  $4.95 \times 10^4$

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**4** Express  $2341_5$  as a number in base 8.

**A**  $346_8$

**B**  $436_8$

**C**  $532_8$

**D**  $623_8$

**5** Evaluate  $11010_2 - 1101_2$ .

**A**  $1011_2$

**B**  $1101_2$

**C**  $10001_2$

**D**  $10011_2$

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**6** In Diagram 1,  $PRS$  and  $QRU$  are straight lines.

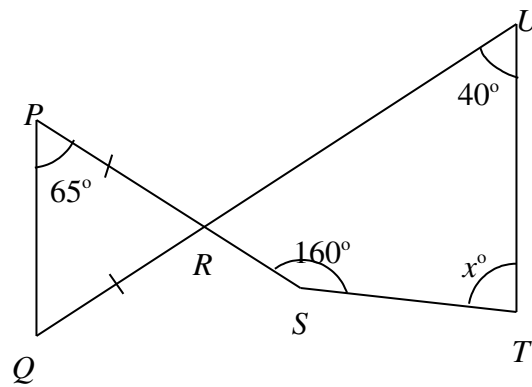


Diagram 1

Find the value of  $x$ .

- A  $95^\circ$
- B  $100^\circ$
- C  $105^\circ$
- D  $110^\circ$

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- 7 In Diagram 2,  $PQRSUV$  is a regular hexagon .  $PUT$  and  $RST$  are straight lines.

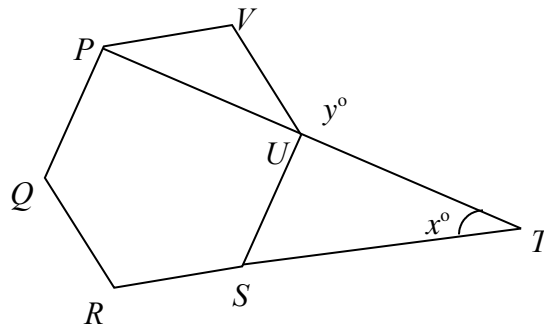


Diagram 1

Find the value  $x + y$

- A  $170^\circ$
- B  $180^\circ$
- C  $190^\circ$
- D  $200^\circ$



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- 8 Diagram 3 shows a circle with centre  $O$  and  $TPQ$  as a tangent to the circle at  $P$ . Given that  $SRQ$  is a straight line.

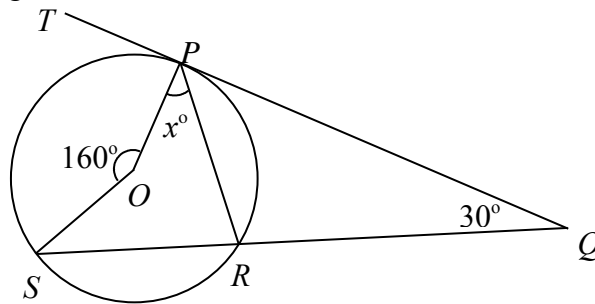


Diagram 3

Find the value of  $x$ .

- A 20
  - B 30
  - C 40
  - D 50
- 9 Diagram 4 shows five quadrilaterals.

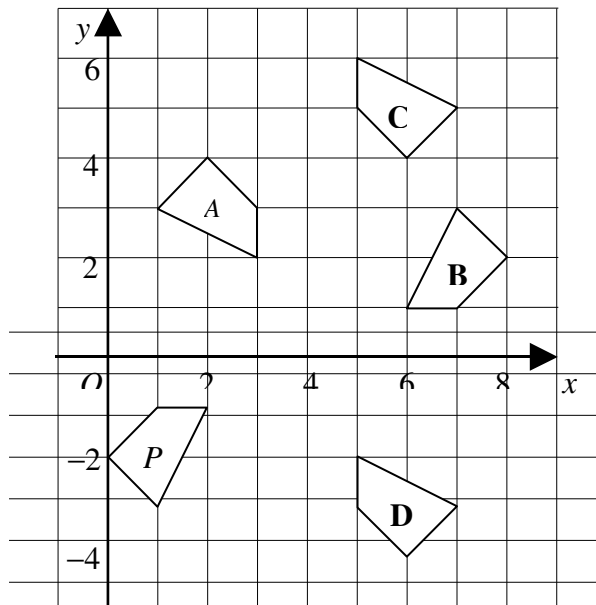


Diagram 4

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Which of the quadrilateral **A**, **B**, **C** or **D** is the image of quadrilateral  $P$  under a rotation of  $90^\circ$  anticlockwise about the center  $(4, 0)$  ?

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10 Diagram 5 shows a triangle  $JKL$ .

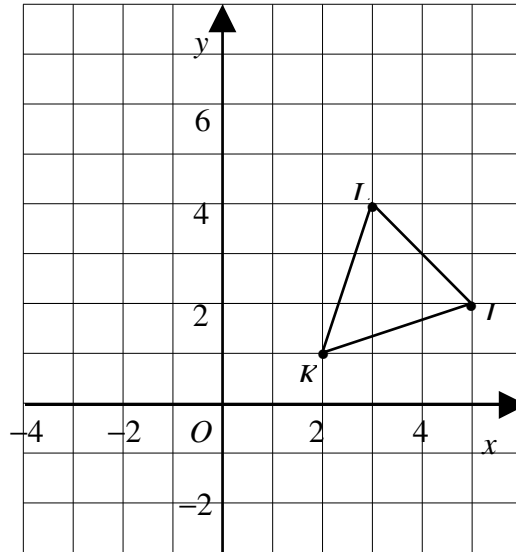


Diagram 5

An enlargement maps  $\triangle JKL$  onto  $\triangle JQR$ . Given that the coordinates of  $Q$  are  $(m, 0)$ . Which of the following information relates correctly to the transformation?

	Value of $m$	Coordinates of point $R$
A	-2	(2, 8)
B	-1	(1, 6)
C	1	(2, 5)
D	0	(2, 6)

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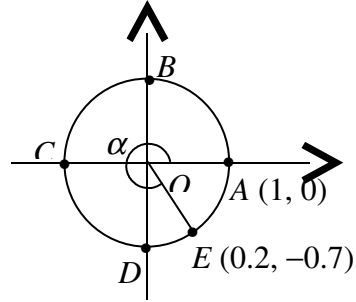


Diagram \*

- 11 In Diagram 6,  $O$  is the center of circle  $ABCDE$ .

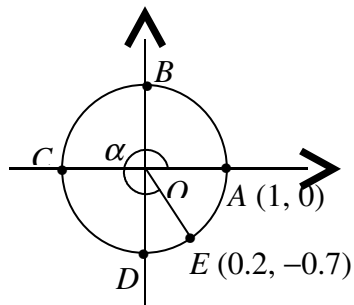


Diagram 6

Find the value of  $\sin \alpha$ .

- A -3.5
- B -0.7
- C -0.2
- D 0.2

- 12 Diagram 7 shows a rectangle  $JKLM$ .

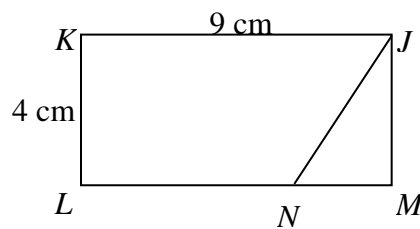


Diagram 7

Given that the ratio of  $LN : LM = 2 : 3$ . Calculate the value of  $\cos \angle LNJ$ .

- A  $\frac{3}{5}$
- B  $\frac{4}{9}$
- C  $-\frac{3}{5}$
- D  $-\frac{4}{5}$

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**13** Diagram 8 shows the graph of  $y = 5x^n$ .

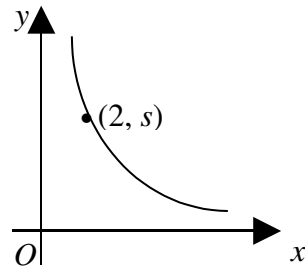


Diagram 8

Find the value of  $s$ .

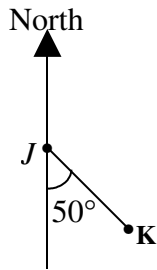
- A** 10
- B** 5
- C** 2
- D**  $\frac{5}{2}$

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**14** Points  $J$  and  $K$  lie on a horizontal plane. The bearing of  $J$  from  $K$  is  $23^\circ$ . The following diagram shows the positions of  $J$  and  $K$ ?

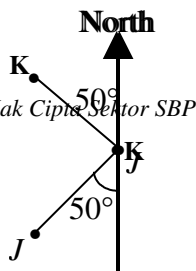
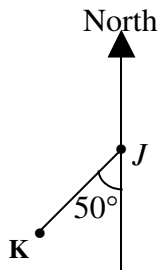
**A**

**B**

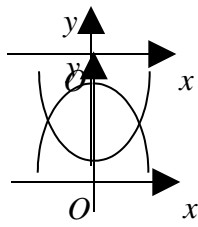


**C**

**D**



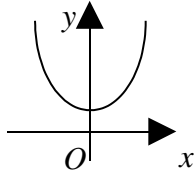
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15 Which of the following graphs represents  $y = ax^2 + c$ , where  $a$  and  $c$  are constants,  $a < 0$  and  $c > 0$ .

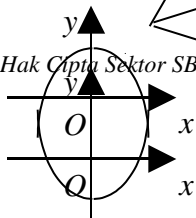
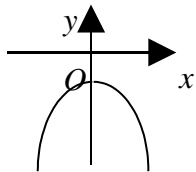
A

B



C

D





- 16 Diagram 9 shows a cuboid with a horizontal base  $PQRS$ .

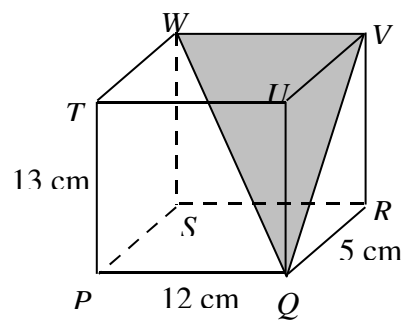


Diagram 9

State the angle between the planes  $WQV$  and  $WSRV$ .

- A  $\angle QVR$
- B  $\angle WQS$
- C  $\angle VQR$
- D  $\angle WQP$

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- 17 Diagram 10 shows a right prism with rectangular base  $PQRS$ . Trapezium  $PQUT$  is the uniform cross-section of the prism.

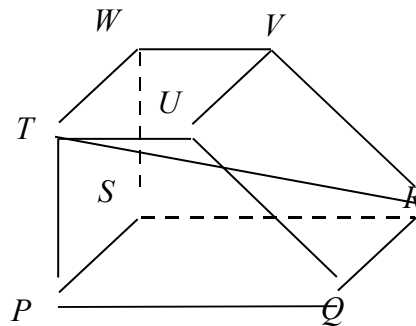


Diagram 10

Identify the angle between the line  $RT$  and the plane  $TUQP$ .

- A  $\angle TRP$
- B  $\angle RTS$
- C  $\angle QRT$
- D  $\angle QTR$

- 18 Diagram 11 shows Nordin observing a kite which is flying vertically above point  $L$ . The horizontal distance between him and point  $L$  is 20 m.

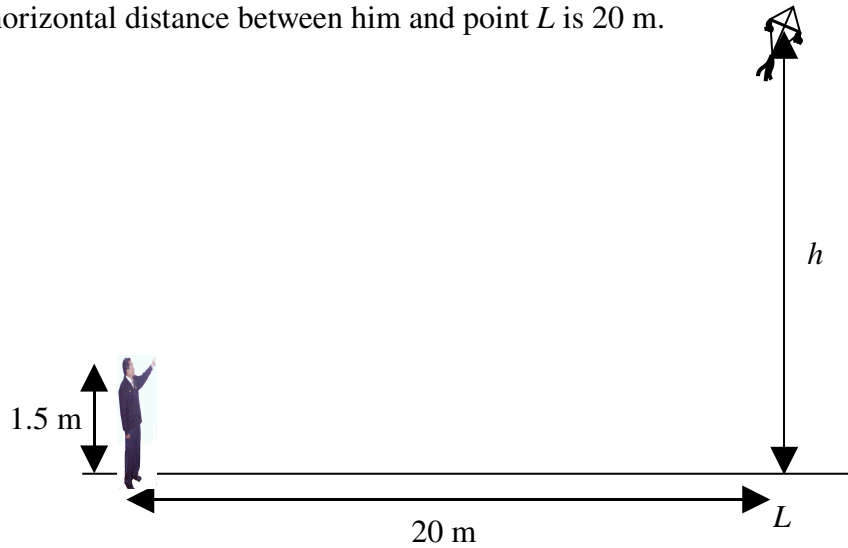


Diagram 11

Given that the angle of elevation of the kite from Nordin is  $15^\circ$ . Find the vertical height,  $h$ , in m, of the kite.

- A 5.36
- B 6.86
- C 74.64
- D 76.14

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**19** Express  $\frac{11}{12p} - \frac{3(2-p)}{4p^2}$  as a single fraction in its simplest form.

**A**  $\frac{10p-9}{6p^2}$

**B**  $\frac{p-9}{6p^2}$

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

**D**  $\frac{4p-3}{3p^2}$

**20**  $(x-y)^2 - (x^2 + y^2) =$

**A**  $-2xy$

**B**  $-2y^2$

**C**  $-2xy - 2y^2$

**D**  $-2xy + y^2$

**21** Given that express  $h$  in the terms of  $k$ .

**A**  $\frac{k^2 + 4}{4}$

**B**  $\frac{k^2 + 2}{2}$

**C**  $(k+2)^2$

**D**  $2k^2 + 1$

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22 Given that  $\frac{2h+7}{3} = h+1$  calculate the value of  $h$ .

- A  $-4$
- B  $\frac{6}{5}$
- C  $6$
- D  $4$

23 Given that  $(2^x)^6 = (4^2)^2$ . Find the value of  $x$ .

- A  $\frac{2}{3}$
- B  $\frac{4}{3}$
- C  $1$
- D  $\frac{8}{3}$

24  $2q^0 \times q^2 \times (3q)^3 =$

- A  $6q^5$
- B
- C  $27q^5$
- D  $54q^5$

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**25** List all the integers  $x$  which satisfy both the inequalities  $x+3 < 2x-3$  and  $x \leq 9$ .

- A** 7, 8, 9
- B** 6, 7, 8
- C** 8, 9, 10
- D** 5, 6, 7

- 26 Diagram 12 shows an incomplete line graph representing the number of car sold in the first six months of the year. The profit gained in March is RM 7000.00.

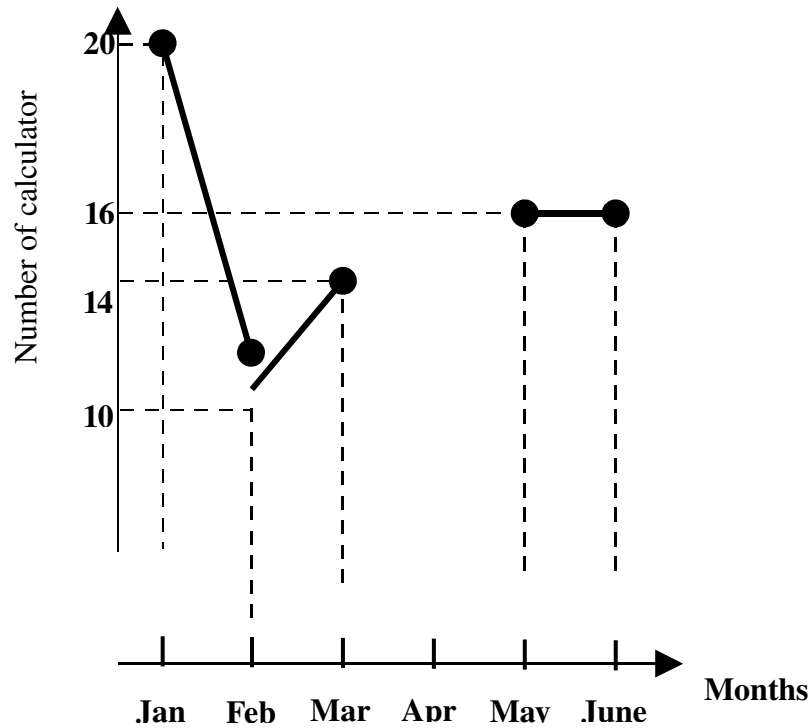


Diagram 12

If the total profit for the first six months is RM45500.00, find the number of car sold in April.

- A 14
- B 15
- C 16
- D 17

- 27 Table 1 shows the number of pencils brought by a group of students to school.

Number of pencils	1	2	3	4	5
Frequency	2	5	5	8	10

The difference between the mode and the median of the data is

- A 0
- B 4
- C 1
- D 6



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- 28** Diagram 13 shows the universal set,  $\xi = R \cup S \cup T$ ,  $n(\xi) = 35$ ,  $n(S) = 17$ ,  $n(R \cap S) = 9$  and  $n(S \cap T) = 3$

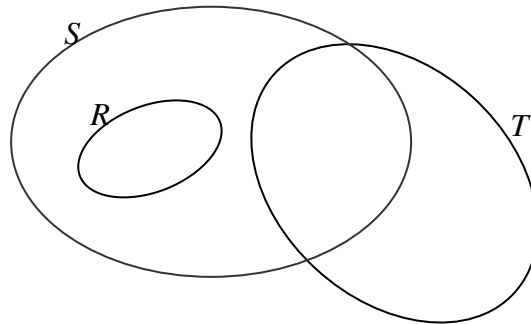


Diagram 13

Find  $n(R' \cap T)$

- A** 17
- B** 18
- C** 21
- D** 26

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**29** Diagram 13 is a Venn diagram which shows the number of element of set  $P$ ,  $Q$  and  $R$ .

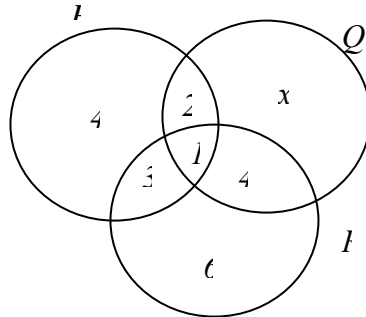


Diagram 13

It is given that the universal set  $\xi = P \cup Q \cup R$  and  $n(Q) = n(P \cup R)$ , find the value of  $x$ .

- A 12
- B 13
- C 18
- D 20

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**30** Diagram 14 is a Venn diagram which shows the universal set  $\xi = P \cup Q \cup R$ .

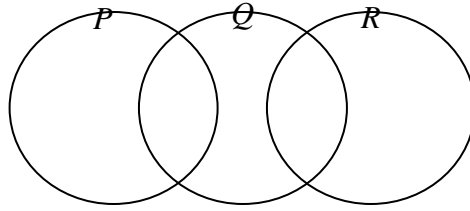


Diagram 14

The shaded region in the Venn Diagram represent the set

- A**     $(P \cap Q) \cap (Q \cap R)$
- B**     $(P \cup Q) \cap (Q \cup R)$
- C**     $(P \cup Q) \cup (Q \cup R)$
- D**     $(P \cap Q) \cup (Q \cap R)$

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**31** In Diagram 15,  $PQ = 5$  units and  $OQ = 2OR$ .

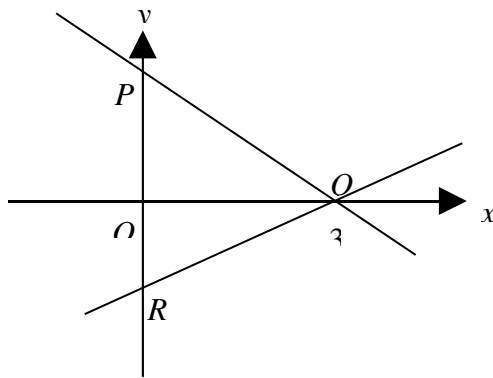


Diagram 15

The equation of  $QR$  is

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

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32 In Diagram 16,  $O E F G$  is a parallelogram.

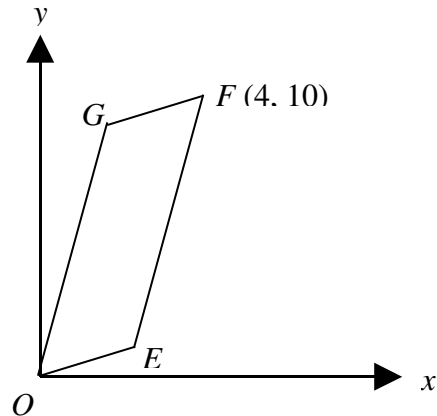


Diagram 16

If the equation of the line  $O E$  is  $y = \frac{1}{4}x$ , the  $y$ -intercept of line  $F G$  is

- A 4
- B 6
- C 9
- D 10

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**33** Given set  $M = \{8, 12, 23, 39, 42, 51, 61, 73, 87\}$ . An element is chosen at random from set  $M$ . State the probability of choosing not a prime number?

**A**  $\frac{1}{3}$

**B**  $\frac{4}{9}$

**C**  $\frac{5}{9}$

**D**  $\frac{2}{3}$

**34** A box contains 36 yellow marbles and a number of red marbles. A marble is picked at random from the box. Probability of getting red marble is  $\frac{5}{9}$ . Another 9 red marbles were added into the box. If a marble is picked at random from the box, what is the probability of getting red marble?

**A**  $\frac{1}{3}$

**B**  $\frac{2}{5}$

**C**  $\frac{3}{5}$

**35** **D**  $\begin{pmatrix} 4 & 3 \\ 7 & 8 \end{pmatrix} - \frac{1}{2} \begin{pmatrix} 6 & -10 \\ 2 & -8 \end{pmatrix} =$

**A**  $\begin{pmatrix} 1 & 2 \\ -4 & 4 \end{pmatrix}$

**B**  $\begin{pmatrix} 1 & -8 \\ 6 & 4 \end{pmatrix}$

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**D**  $\begin{pmatrix} 1 & 2 \\ 6 & 12 \end{pmatrix}$

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**36** Given  $(6 \ p) \begin{pmatrix} p & -3 \\ 4 & 1 \end{pmatrix} = (-20 \ -20)$ , calculate the value of  $p$ .

**A** -10

**B** -2

**C** 4

**D** 12

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- 37** In Diagram 17,  $UGRS$  is Greenwich Meridian.  $O$  is the centre of the earth.  $POQ$  and  $UOS$  are the diameters of the earth.

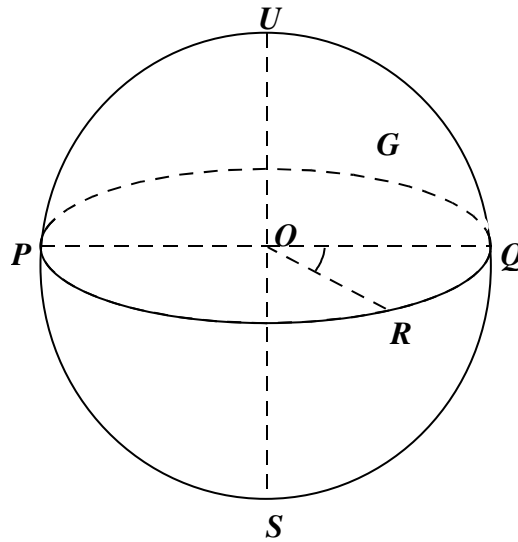


Diagram 17

Given  $PR = 3RQ$ . Find the longitude of  $P$ .

- A  $120^\circ\text{W}$
- B  $120^\circ\text{E}$
- C  $135^\circ\text{W}$
- D  $135^\circ\text{E}$



- 38 In Diagram 18,  $N$  is the North Pole,  $S$  is the South Pole and  $NOS$  is the axis of the earth.  $PRQ$  is the equator and  $NGS$  is Greenwich Meridian.

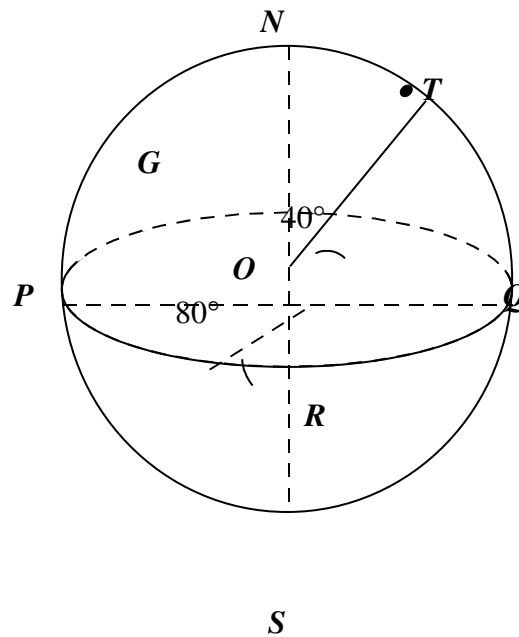


Diagram 18

The position of point  $T$  is

- A (40°N, 80°E)
- B (40°N, 100°E)
- C (50°N, 80°E)
- D (50°N, 100°E)

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**39** It is given that  $y$  varies inversely as  $x^n$  and  $y = 8$  when  $x = 1$ . Calculate the value of  $n$  when  $y = 72$  and  $x = 3$ .

- A** -2
- B** -3
- C** 2
- D** 3

**40** Table 2 shows some values of  $p$ ,  $q$ , and  $r$ .

$p$	$\frac{3}{2}$	12
$q$	2	$m$
$r$	8	$\frac{1}{2}$

Table 2

Given that  $p \propto \frac{q}{\sqrt{2r}}$ , calculate the value of  $m$ .

- A** 1
- B** 2
- C** 4
- D** 8

**END OF QUESTION PAPER**

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**INFORMATION FOR CANDIDATES**

1. This question paper consists of 40 questions.
2. Answer **all** questions.
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.
4. If you wish to change your answer, erase the blackened mark that you have done. Then blacken the space for the new answer.
5. The diagrams in the questions provided are not drawn to scale unless stated.
6. A list of formulae is provided on page 2 to 3.

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7. You may use a non-programmable scientific calculator.