JABATAN PELAJARAN NEGERI SELANGOR
PERSIDANGAN KEBANGSAAN PENGETUA SEKOLAH MENENGAH

PROGRAM PENINGKATAN PRESTASI AKADEMIK (2) **1449/1**

SIJIL PELAJARAN MALAYSIA 2010

MATHEMATICS

Kertas 1
Sept./Okt.
1¼ jam **Satu jam lima belas minit**

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.*

Kertas soalan ini mengandungi 19 halaman bercetak dan 1 halaman tidak bercetak.

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

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

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

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

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

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

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

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

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SHAPES AND SPACE
BENTUK DAN RUANG

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

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

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

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

3 Area of circle = πr^2

Luas bulatan = πj^2

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

Luas permukaan melengkung silinder = $2\pi jt$

5 Surface area of sphere = $4\pi r^2$

Luas permukaan sfera = $4\pi j^2$

6 Volume of right prism = cross sectional area × length

Isi padu prisma tegak = *luas keratan rentas* × *panjang*

7 Volume of cylinder = $\pi r^2 h$

Isi padu silinder = $\pi j^2 t$

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

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

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

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

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

Isi padu piramid tegak = $\frac{1}{3}$ × *luas tapak* × *tinggi*

11 Sum of interior angles of a polygon = $(n - 2) \times 180°$

Hasil tambah sudut pedalaman poligon

12 $\frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360°}$ $\frac{\textit{panjang lengkok}}{\textit{lilitan bulatan}} = \frac{\textit{sudut pusat}}{360°}$

13 $\frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360°}$ $\frac{\textit{luas sektor}}{\textit{luas bulatan}} = \frac{\textit{sudut pusat}}{360°}$

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

Faktor skala

15 Area of image = k^2 × area of object

Luas imej = k^2 × *luas objek*

[Lihat halaman sebelah

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1 Round off 33 083 correct to four significant figures.
Bundarkan 33 083 *betul kepada empat angka bererti.*

A 33 000

B 33 080

C 33 090

D 33 100

2 Express $2{\cdot}407 \times 10^3$ as a single number.
Ungkapkan $2{\cdot}407 \times 10^3$ *sebagai satu nombor tunggal.*

A 0·00247

B 2 407

C 24 070

D 240 700

3 $4{\cdot}78 \times 10^4 - 3{\cdot}21 \times 10^3 =$

A $1{\cdot}57 \times 10^4$

B $4{\cdot}459 \times 10^4$

C $4{\cdot}459 \times 10^7$

D $1{\cdot}57 \times 10^3$

4 $10011_2 + 11_2 =$

A 10110_2

B 10100_2

C 10010_2

D 11010_2

5 Express $5^4 + 3$ as a number in base five.
Ungkapkan $5^4 + 3$ *sebagai satu nombor dalam asas lima.*

A 5003_5

B 5043_5

C 1003_5

D 10003_5

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6 In Diagram 1, *TUVS* is a parallelogram and *PQRST* is a regular pentagon.
Dalam Rajah 1, TUVS ialah sebuah segi empat selari dan PQRST adalah pentagon sekata.

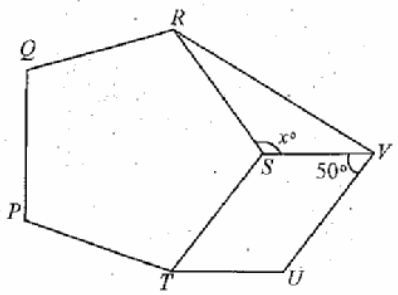

Diagram 1
Rajah 1

Find the value of x.
Cari nilai x.

A 122

B 128

C 130

D 132

7 Diagram 2 shows *ABCDEF* is a regular hexagon. *AFG* is a straight line.
Rajah 2 menunjukkan ABCDEF ialah sebuah heksagon sekata. AFG adalah garis lurus.

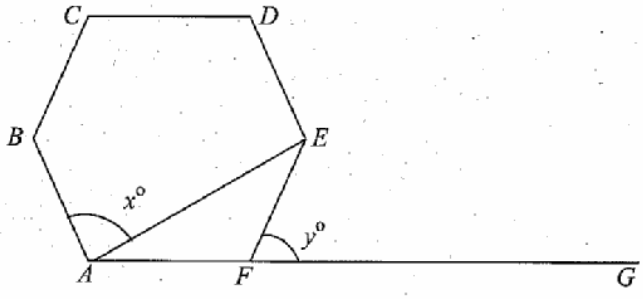

Diagram 2
Rajah 2

Find the value of $x + y$.
Cari nilai x + y.

A 130

B 140

C 150

D 180

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8 In Diagram 3, O is the centre of the circle and UTV is a tangent to the circle at T.
Dalam Rajah 3, O ialah pusat bulatan dan UTV ialah tangen kepada bulatan di T.

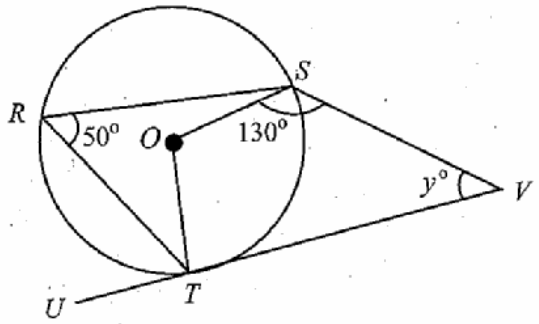

Diagram 3
Rajah 3

Find the value of y.
Cari nilai y.

A 35

B 40

C 50

D 60

9 In Diagram 4, T' is the image of T under an anticlockwise rotation of 90° about the fixed point.
Dalam Rajah 4, T' adalah imej bagi T di bawah suatu putaran 90° lawan arah jam pada suatu titik tetap.

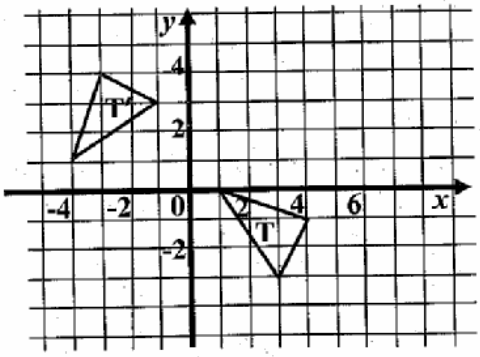

Diagram 4
Rajah 4

State the coordinate of the centre of rotation.
Nyatakan koordinat pusat putaran tersebut.

A $(-3, -2)$

B $(-2, -3)$

C $(-3, -3)$

D $(-2, -2)$

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10 Diagram 5 shows *FG'H'J'E'* and *FGHJE*, drawn on square grids.
Rajah 5 menunjukkan FG'H'J'E' dan FGHJE, dilukis pada grid segi empat sama.

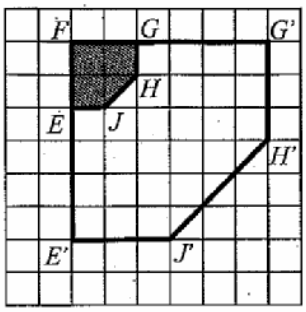

Diagram 5
Rajah 5

FG'H'J'E' is the image of *FGHJE* under an enlargement about the center *F* with a scale factor *k*. State the value of *k*.

FG'H'J'E' ialah imej bagi FGHJE di bawah suatu pembesaran pada pusat F dengan faktor skala k. Nyatakan nilai k.

A –2

B –3

C 3

D 4

11 In Diagram 6, *NOP* is a straight line.
Dalam Rajah 6, NOP adalah satu garis lurus.

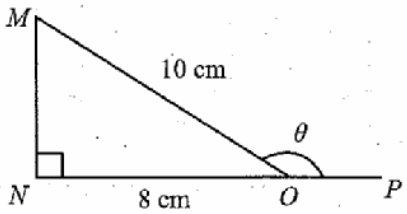

Diagram 6
Rajah 6

Find the value of tan θ.
Cari nilai tan θ.

A $\frac{5}{4}$

B $-\frac{3}{5}$

C $-\frac{3}{4}$

D $\frac{4}{5}$

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12 In Diagram 7, O is the origin of a Cartesian plane and OQ is a straight line.
Dalam Rajah 7, O ialah asalan pada satah Cartesian dan OQ ialah suatu garis lurus.

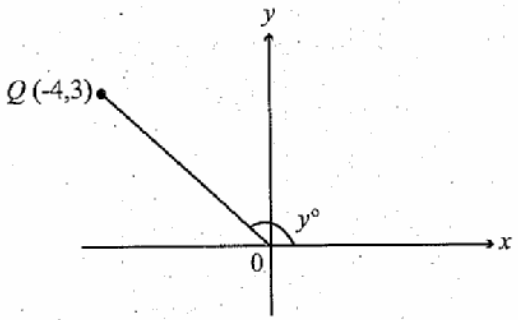

Diagram 7
Rajah 7

Find the value of cos y.
Cari nilai kos y.

A $-\frac{3}{5}$

B $-\frac{4}{5}$

C $\frac{3}{5}$

D $\frac{4}{5}$

13 Diagram 8 shows the graph of $y = \cos x$ for $0° \leq x \leq 360°$.
Rajah 8 menunjukkan graf $y = \cos x$ bagi $0° \leq x \leq 360°$.

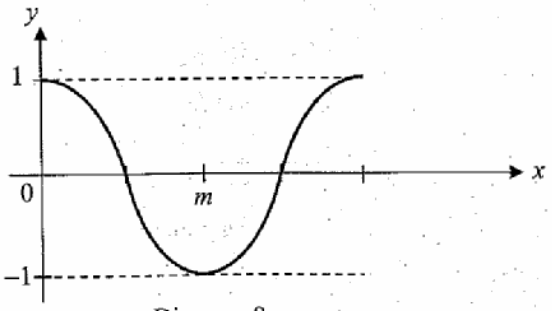

Diagram 8
Rajah 8

The value of m is
Nilai bagi m ialah

A 90°

B 180°

C 270°

D 360°

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14 Diagram 9 shows a cuboid.
Rajah 9 menunjukkan sebuah kuboid.

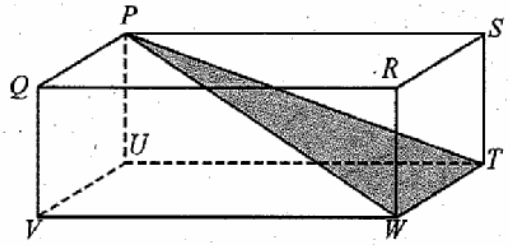

Diagram 9
Rajah 9

Name the angle between the plane *PTW* and the base *RSTW*.
Namakan sudut di antara satah PTW dengan tapak RSTW.

A $\angle PTS$

B $\angle PTU$

C $\angle PWU$

D $\angle PWR$

15 In Diagram 10, *PQ* and *RS* are two vertical poles on a horizontal ground. The angle of depression of peak *R* from peak *P* is 30°.

Dalam Rajah 10, PQ dan RS ialah dua batang tiang tegak yang terletak pada satu permukaan mengufuk. Sudut tunduk puncak R dari puncak P ialah 30°.

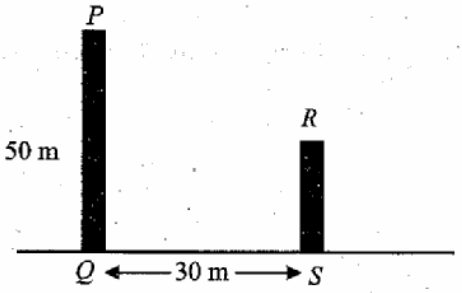

Diagram 10
Rajah 10

Calculate the height in m, of the pole *RS*.
Hitung tinggi, dalam m, *bagi tiang RS.*

A 15·36

B 17·32

C 32·36

D 32·68

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16 Diagram 11 shows the positions of point P and Q.
Rajah 11 *menunjukkan kedudukan titik P dan titik Q.*

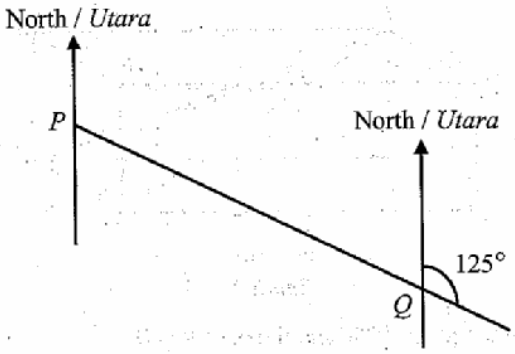

Diagram 11
Rajah 11

Find the bearing of P from Q.
Cari bearing P dari Q.

A 315°

B 305°

C 125°

D 055°

17 P (20°S, 50°W) and Q are two points on the surface of the earth and PQ is the diameter of the earth. Find the location of Q.

P (20°*S*, 50°*B*) *dan Q ialah dua titik yang terletak di permukaan bumi dan PQ ialah diameter bumi. Cari kedudukan bagi Q.*

A (20°S, 130°E)
(20°S, 130°T)

B (20°N, 130°E)
(20°U, 130°T)

C (20°S, 130°W)
(20°S, 130°B)

D (20°N, 130°W)
(20°U, 130°B)

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18 In Diagram 12, N is the North Pole and S is the South Pole. The longitude of P is $40°W$ and $\angle POQ = 100°$.

Dalam Rajah 12, U ialah Kutub Utara dan S ialah Kutub Selatan. Longitud P ialah $40°B$ *dan* $\angle POQ = 100°$.

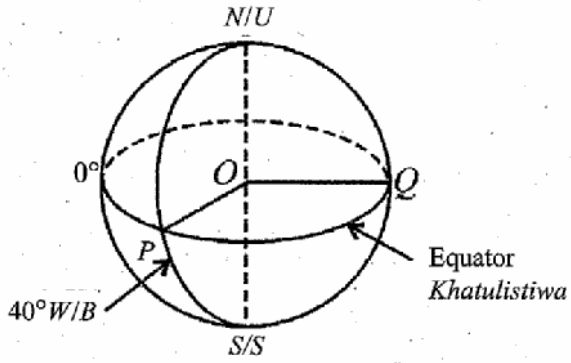

Diagram 12
Rajah 12

Find the longitude of Q.
Cari longitud bagi titik Q.

A $60°E$
$60°T$
B $60°W$
$60°B$
C $140°E$
$140°T$
D $140°W$
$140°B$

19 $4(3-2y)(y-1) =$

A $-8y^2 + 5y - 3$
B $-8y^2 - 5y + 3$
C $8y^2 - 20y + 12$
D $-8y^2 + 20y - 12$

20 Given that $7 - 2(3-m) = 3m - 1$, find the value of m.
Diberi, $7 - 2(3-m) = 3m - 1$, *cari nilai m.*

A –2
B 1
C 2
D 4

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21 Given $y = \frac{w}{2+w}$, express w in terms of y.

Diberi $y = \frac{w}{2+w}$, *ungkapkan* w *dalam sebutan* y.

A $w = \frac{2y}{(1-y)}$

B $w = \frac{2y}{(1+y)}$

C $w = \frac{(1-y)}{2y}$

D $w = \frac{(1+y)}{2y}$

22 Express $\frac{p+3}{q} - \frac{3p+4}{pq}$ as a single fraction in its simplest form.

Ungkapkan $\frac{p+3}{q} - \frac{3p+4}{pq}$ *sebagai satu pecahan tunggal dalam bentuk termudah.*

A $\frac{p^2-4}{pq}$

B $\frac{p^2+4}{pq}$

C $\frac{(p-2)(p-2)}{pq}$

D $\frac{p^2-6p-4}{pq}$

23 If $5^{-2} \div 125 = 5^n$, then $n =$
Jika $5^{-2} \div 125 = 5^n$, *maka* $n =$

A -5

B -1

C 1

D 5

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24 Simplify $\dfrac{m^6 \times \left(16n^2\right)^{\frac{1}{2}}}{\left(m^4n^8\right)^{\frac{1}{4}}}$

Ringkaskan $\dfrac{m^6 \times \left(16n^2\right)^{\frac{1}{2}}}{\left(m^4n^8\right)^{\frac{1}{4}}}$

A $\dfrac{4m^5}{n}$

B $\dfrac{4m^2}{n}$

C $\dfrac{8m^5}{n}$

D $\dfrac{16m^5}{n}$

25 List all the integers x which satisfy both inequalities $3x + 2 > -2$ and $3 - x > 1$.
Senaraikan semua integer x yang memenuhi kedua-dua ketaksamaan $3x + 2 > -2$ *dan* $3 - x > 1$.

A 0, 1

B −1, 0, 1

C −2, 0, 1

D −2, 0, 1, 2

26 Find the solution for $\dfrac{m}{2} + 1 \geq 2m + 7$.

Cari penyelesaian bagi $\dfrac{m}{2} + 1 \geq 2m + 7$.

A $m \geq 4$

B $m \leq -4$

C $m \geq -4$

D $m \leq 4$

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27 Diagram 13 shows the graph of $y = -x^3 + 6$. State the coordinates of A.
Rajah 13 *menunjukkan graf* $y = -x^3 + 6$. *Nyatakan koordinat bagi A.*

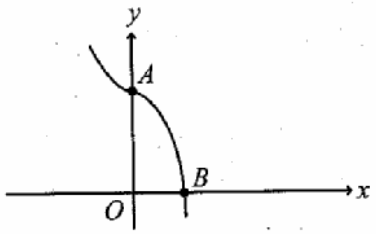

Diagram 13
Rajah 13

A (0, 4)

B (0, 2)

C (0, 6)

D (6, 0)

28 Diagram 14 shows the number of students in lower secondary forms in a school.
Rajah 14 *menunjukkan bilangan pelajar menengah rendah dalam sebuah sekolah.*

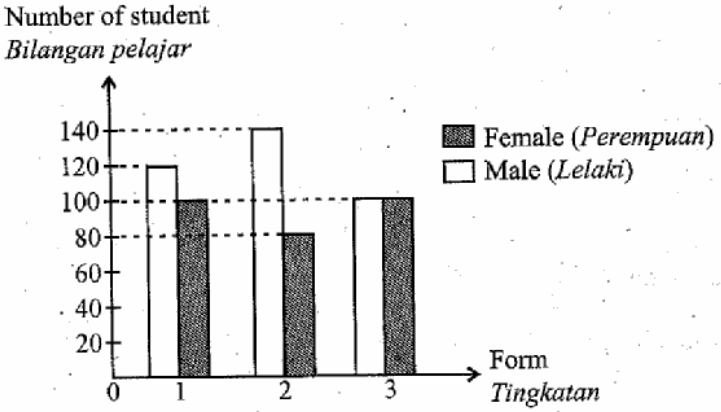

Diagram 14
Rajah 14

Calculate the fraction which represent the male students.
Hitung pecahan yang mewakili pelajar lelaki.

A $\frac{7}{9}$

B $\frac{7}{16}$

C $\frac{9}{16}$

D $\frac{11}{15}$

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29 $\xi = \{x : 4 \leq x \leq 20,\ x \text{ is an integer}\}$.
$A = \{x : x \text{ is a multiple of } 2\}$.
$B = \{x : x \text{ is a factor of } 20\}$.
List the elements of set $A \cap B$.

$\xi = \{x : 4 \leq x \leq 20,\ x \textit{ ialah integer}\}$.
$A = \{x : x \textit{ ialah gandaan bagi } 2\}$.
$B = \{x : x \textit{ ialah faktor bagi } 20\}$.
Senaraikan unsur-unsur bagi set $A \cap B$.

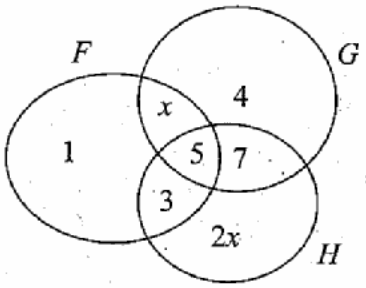
A {4}

B {4, 10}

C {4, 20}

D {4, 10, 20}

30 In the Venn diagram below, the number of elements in set F, G and H are shown.
Dalam gambar rajah Venn di bawah, bilangan unsur di dalam set F, G dan H ditunjukkan.



Given that the universal set $\xi = F \cup G \cup H$, $n(\xi) = 50$, find the value of x.
Diberi bahawa set semesta $\xi = F \cup G \cup H$, $n(\xi) = 50$, *cari nilai* x.

A 6

B 8

C 10

D 25

31 Given that set $P = \{1, 2, 3, 4\}$, find the number of subsets of P.
Diberi bahawa set $P = \{1, 2, 3, 4\}$, *cari bilangan subset bagi* P.

A 4

B 6

C 8

D 16

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32 The gradient of the line $3x - 4y = 12$ is
Kecerunan bagi garis $3x - 4y = 12$ *ialah*

A -3

B $\frac{-3}{4}$

C $\frac{3}{4}$

D 3

33 The x-intercept of the line $x + y = 6$ is
Pintasan-x bagi garis $x + y = 6$ *ialah*

A 2

B 4

C 6

D 8

34 In a group of 80 students, 50 of them are females. Another 10 male students then join the group. If a student is then chosen at random from the group, the probability of choosing a male student is

Dalam sekumpulan 80 *orang pelajar,* 50 *orang daripada mereka adalah perempuan.* 10 *orang pelajar lelaki yang lain telah menyertai kumpulan tersebut. Jika seorang pelajar telah dipilih secara rawak dari kumpulan tersebut, kebarangkalian memilih seorang pelajar lelaki ialah*

A $\frac{1}{90}$

B $\frac{2}{7}$

C $\frac{1}{2}$

D $\frac{4}{9}$

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35 A basket contains apples of which 12 are red and the rest green. Given that the probability of picking a green apple at random from the basket is $\frac{8}{11}$, find the number of green apples in the basket.

Sebuah bakul mengandungi 12 *biji epal merah dan selebihnya adalah hijau. Diberi kebarangkalian mendapat epal hijau adalah* $\frac{8}{11}$, *cari bilangan epal hijau di dalam bakul tersebut.*

A 16

B 32

C 36

D 44

36 If S varies directly as the square root of R, the relation between S and R is

Jika S berubah secara langsung dengan punca kuasa dua R, hubungan di antara S dan R ialah

A $S \propto R$

B $S \propto R^2$

C $S \propto R^{\frac{1}{2}}$

D $S \propto \frac{1}{R^{\frac{1}{2}}}$

37 Table 1 shows the relation between the three variables, s, p and m.

If $s \propto \frac{p}{\sqrt{m}}$, calculate the value of x.

Jadual 1 *menunjukkan hubungan di antara tiga pemboleh ubah, s, p dan m.*

Jika $s \propto \frac{p}{\sqrt{m}}$, *kirakan nilai x.*

s	2	8
p	6	x
m	4	9

Table 1
Jadual 1

A 16

B 36

C 54

D 108

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38 It is given that m varies inversely as s and t. If $m = 3$ when $s = 2$ and $t = 4$, find the value of m when $s = 2$ and $t = 6$.

Diberi bahawa m berubah secara songsang dengan s dan t. Jika m = 3 apabila s = 2 dan t = 4, cari nilai m apabila s = 2 dan t = 6.

A 2

B 3

C 4

D 5

39 $\begin{pmatrix} 1 & 3 \\ 2 & 4 \end{pmatrix}\begin{pmatrix} -2 \\ 3 \end{pmatrix} =$

A $\begin{pmatrix} 4 \\ 6 \end{pmatrix}$

B $(7 \quad 8)$

C $\begin{pmatrix} 7 \\ 8 \end{pmatrix}$

D $(4 \quad 6)$

40 Given that $\begin{pmatrix} 2 \\ m \end{pmatrix}(2 \ \ m) = \begin{pmatrix} 4 & 6 \\ 2m & 9 \end{pmatrix}$, find the value of m.

Diberi bahawa $\begin{pmatrix} 2 \\ m \end{pmatrix}(2 \ \ m) = \begin{pmatrix} 4 & 6 \\ 2m & 9 \end{pmatrix}$, *carikan nilai m.*

A 0

B 1

C 2

D 3

END OF QUESTION PAPER

KERTAS SOALAN TAMAT

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