Matematik
Kertas 1
September 2013
1 ¼ Jam

BAHAGIAN PENGURUSAN SEKOLAH BERASRAMA PENUH
DAN SEKOLAH KECEMERLANGAN
KEMENTERIAN PENDIDIKAN MALAYSIA

PENTAKSIRAN DIAGNOSTIK AKADEMIK SBP 2013
PERCUBAAN SIJIL PELAJARAN MALAYSIA

MATEMATIK

Kertas 1

1 Jam 15 Minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

Arahan:

1. *Kertas soalan ini mengandungi* **40** *soalan.*

2. *Jawab* **semua** *soalan.*

3. *Tiap-tiap soalan diikuti oleh empat pilihan jawapan iaitu* **A, B, C** *dan* **D.** *Bagi tiap-tiap soalan, pilih* **satu** *jawapan sahaja.* **Hitamkan** *jawapan anda pada kertas jawapan objektif yang disediakan.*

 Lihat Halaman Sebelah

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 $P(A) = \frac{n(A)}{n(S)}$

6 $P(A') = 1 - P(A)$

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

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

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

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

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

12 Pythagoras Theorem

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

13 $m = \frac{y_2 - y_1}{x_2 - x_1}$

14 $m = -\frac{y\text{-intercept}}{x\text{-intercept}}$

SHAPES AND SPACE

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

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

3 Area of circle = πr^2

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

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

6 Volume of right prism = cross sectional area × 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 = $\frac{1}{3}$ × base area× height

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

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

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 × area of object

1 Express 5.741×10^{-4} as a single number.
Ungkapkan 5.741×10^{-4} sebagai nombor tunggal.

A 0.05741
B 0.005741
C 0.0005741
D 0.00005741

2 Round of 85 462 correct to three significant figures.
Bundarkan 85 462 betul kepada tiga angka bererti.

A 854
B 855
C 85 400
D 85 500

3 $6.4\times10^{-12}+4.6\times10^{-13}=$

A 1.10×10^{-12}
B 1.10×10^{-13}
C 6.86×10^{-12}
D 6.86×10^{-13}

4 $\dfrac{0.05187}{3.14\times1.258}=$

A 1.1313×10^{-2}
B 1.1313×10^{2}
C 2.0781×10^{-2}
D 2.0781×10^{2}

5 Given that $111010_{\ 2}=q_5$, then q is

Diberi $111010_{\ 2}=q_5$, *maka q ialah*

A 103
B 213
C 214
D 312

6 $11101_2-1111_2=$

A 101010_2
B 101110_2
C 1110_2
D 101101_2

7 In Diagram 1, *PQRST* is a regular pentagon. *UTR* is a straight line.

Dalam Rajah 1, *PQRST* ialah pentagon sekata. *UTR* ialah garis lurus.

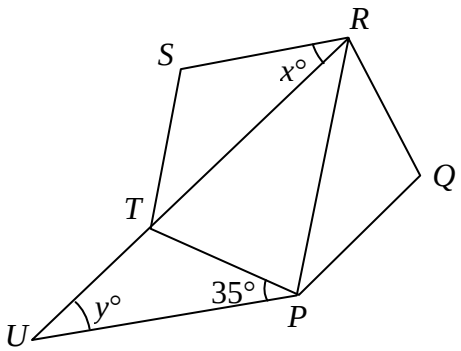


Diagram 1
Rajah 1

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

A 36
B 73
C 109
D 146

8 In Diagram 2, *UTV* is a tangent to the circle *PQST* at *T*. *PQR* and *RST* are straight lines.
Dalam Rajah 2, UTV ialah tangen kepada bulatan PQST di T. PQR dan RST adalah garis lurus.

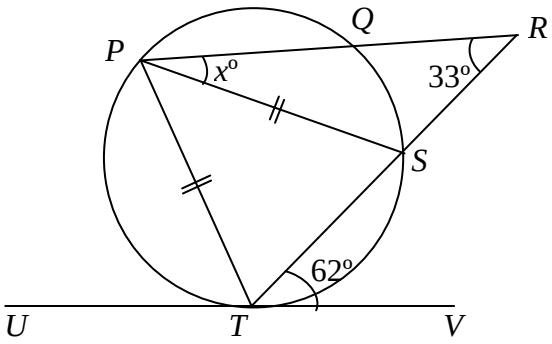


Diagram 2
Rajah 2

Calculate the value of *x*.
Hitungkan nilai x.

A 11.5
B 23
C 26
D 29

9 Diagram 3 shows two pentagons, *R* and *S*, drawn on square grids.

Rajah 3 menunjukkan dua pentagon R dan S, dilukis pada grid segiempat sama.

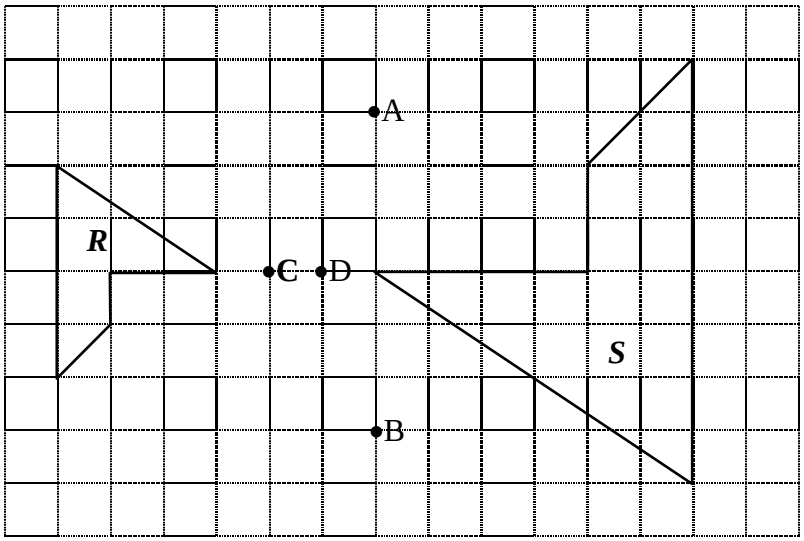


Diagram 3
Rajah 3

S is the image of *R* under an enlargement.

Which of the point **A**, **B, C** or **D** is the centre of the enlargement?

S adalah imej bagi R di bawah suatu pembesaran.

*Yang manakah di antara titik **A**, **B**, **C** atau **D** ialah pusat pembesaran?*

10 Diagram 4 is drawn on a Cartesian plane.
Rajah 4 dilukis pada suatu satah Cartesan.

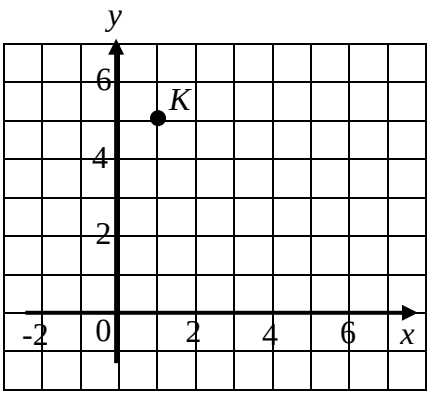


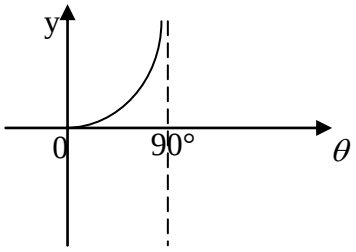
Diagram 4
Rajah 4

Given
R = clockwise rotation of 90° about the centre (3,2)
S = reflection in the line $x = 5$.
Find the coordinates of the image of point ***K*** under the combined transformation ***SR***.
Diberi
R *= putaran 90° ikut arah jam pada pusat (3, 2)*
S *= pantulan pada garis* $x = 5$
Cari koordinat ime titik ***K*** *di bawah gabungan penjelmaan* ***SR***.

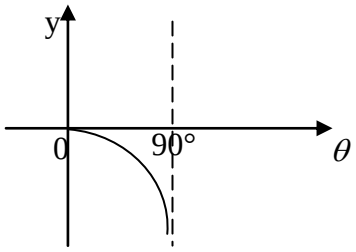
A (3, 5)
B (3, 4)
C (4, 3)
D (4, 4)

11 Which of the following represents part of the graph $y = -\tan\theta$?
Antara berikut, yang manakah mewakili sebahagian graf $y = -\tan\theta$?

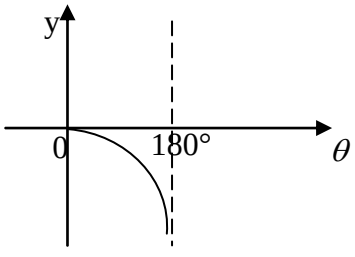
A



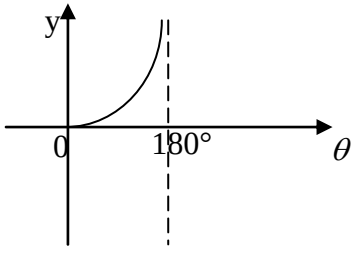
B



C



D



12 In Diagram 5, TQRS and RUV are straight lines. Q is the midpoint of TR . Given PR = 2RU = 10 cm and sin $x°$ = $\frac{4}{5}$. Find the value of cos $y°$.

Dalam Rajah 1, TQRS dan RUV ialah garis lurus. Q adalah titik tengah bagi garis lurus TR. Diberi bahawa PR =2RU = 10 cm dan sin $x°$ = $\frac{4}{5}$. Cari nilai kos $y°$.

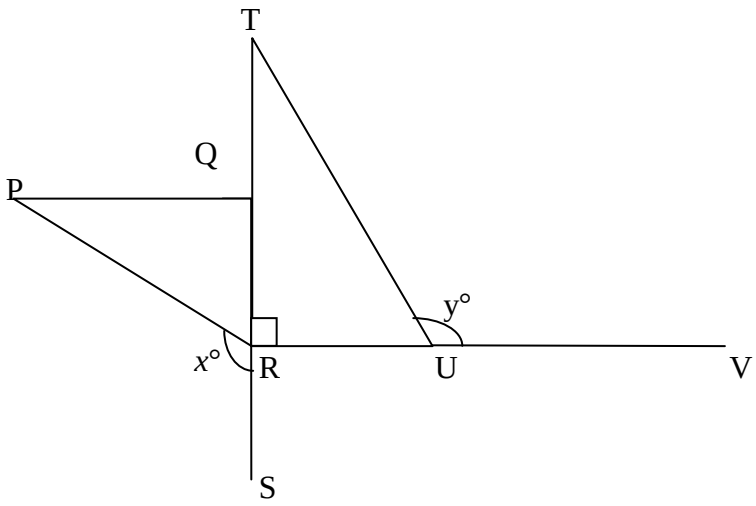


Diagram 5
Rajah 5

A $\frac{12}{13}$

B $-\frac{10}{13}$

C $\frac{5}{13}$

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

13 In Diagram 6, O is the origin , OT and OR are straight lines on the Cartesian plane. The value of $\sin\theta$ is

Dalam Rajah 6, O ialah asalan , OT dan OR adalah garis lurus pada suatu satah Cartesan. Nilai bagi sin θ adalah

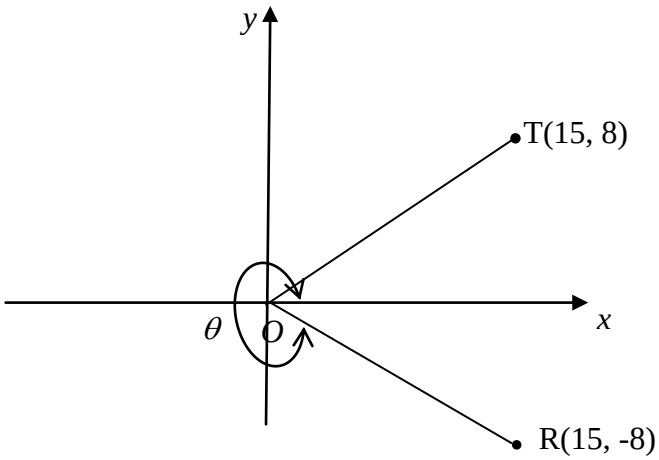


Diagram 6
Rajah 6

A $\frac{8}{17}$

B $-\frac{8}{17}$

C $\frac{8}{15}$

D $-\frac{8}{15}$

14 Diagram 7 shows a cuboid.
Rajah 7 menunjukkan sebuah kuboid.

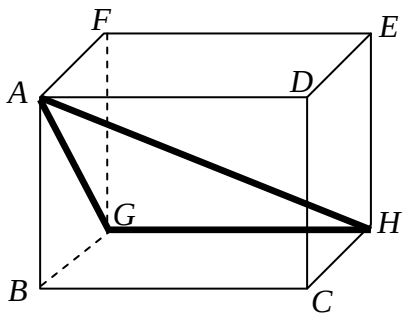


Diagram 7
Rajah 7

Name the angle between the plane *AHG* and the plane *BCHG*
Namakan sudut di antara satah AHG dan satah BCHG

A $\angle AGH$
B $\angle GAB$
C $\angle AGB$
D $\angle AHC$

15 Diagram 8 shows a box and a tower on a horizontal plane. The angle of depression of the box from the top of the tower is 48°.
Rajah 8 menunjukkan sebuah kotak dan sebuah menara di atas satah mengufuk. Sudut tunduk kotak tersebut dari atas menara adalah 48°.

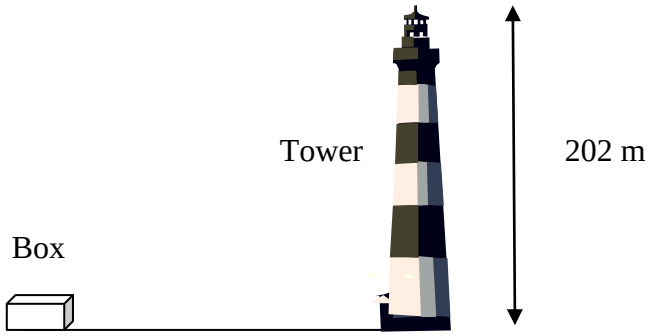


Diagram 8
Rajah 8

If the height of the tower is 202 m, find the distance between the base of the tower and the box, in metre.
Jika tinggi menara itu adalah 202 m, cari jarak di antara tapak menara dengan kotak tersebut, dalam meter.

A 181.78
B 181.88
C 224.34
D 224.44

16 In Diagram 9, *PQ* and *ST* are two vertical poles on a horizontal plane. *R* is a point on *PQ* such that *RQ = ST*.
Dalam Rajah 9, PQ dan ST adalah dua batang tiang tegak pada satah mengufuk. R adalah satu titik pada tiang PQ dengan keadaan RQ = ST.

Diagram 9
Rajah 9

The angle of elevation of *P* from *S* is
Sudut dongakan P dari S ialah
A $\angle SPR$
B $\angle SRP$
C $\angle PSR$
D $\angle RSQ$

17 In Diagram 10, *KRS* is a tangent to the circle *RQP* with centre *O*, at *R*. *QPS* is a straight line.
Dalam Rajah 10, KRS adalah tangen kepada bulatan RQP berpusat O, di R. QPS ialah garis lurus.

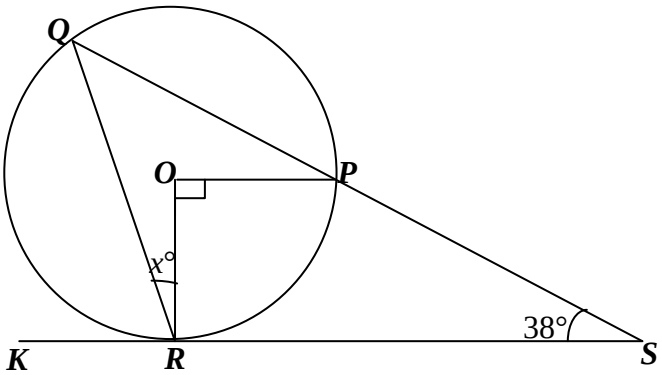


Diagram 10
Rajah 10

Find the value of *x*.
Cari nilai x.
A 7
B 17
C 45
D 52

18 Given the speed of a car is $(3x - 4)$ ms^{-1}. Find the distance of the car that travels in $(2 + x)$ seconds.

Diberi laju sebuah kereta ialah $(3x - 4)$ ms^{-1}. Carikan jarak perjalanan kereta itu dalam masa $(2 + x)$ saat.

A $3x^2 - 2x - 8$
B $3x^2 + 2x - 8$
C $4x - 2$
D $2x - 6$

19 Express $\frac{3y+4}{3} - \frac{2y-3}{6y}$ as a single fraction in its simplest form.

Ungkapkan $\frac{3y+4}{3} - \frac{2y-3}{6y}$ sebagai satu pecahan tunggal dalam bentuk termudah.

A $\frac{2y^2+2y-1}{2y}$

B $\frac{2y^2+2y+1}{2y}$

C $\frac{6y^2+6y-3}{6y}$

D $\frac{6y^2+6y+3}{6y}$

20 In Diagram 11, A and B are two points on a common parallel of latitude *y*°*S*.
Dalam Rajah 11, A dan B adalah dua titik yang berada pada selarian latitud y°S.

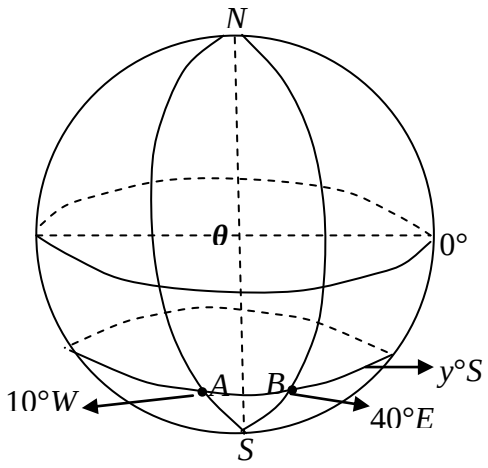


Diagram 11
Rajah 11

If an aeroplane flew at 200 knots from *A* to *B* for 1.2 hours, the value of *y* is
Jika sebuah kapal terbang terbang dari A ke B dengan kelajuan 22 knot selama 1.2 jam, nilai y ialah

A 82° 20□
B 85° 25□
C 87° 42□
D 88° 34□

21 Given that $\frac{d}{t} = \frac{m+1}{2m}$, express *m* in terms of *d* and *t*.

Diberi bahawa $\frac{d}{t} = \frac{m+1}{2m}$, *ungkapkan m dalam sebutan d dan t.*

A $m = \frac{t}{2d - t}$

B $m = \frac{t}{t - 2d}$

C $m = \frac{t}{2d + t}$

D $m = \frac{t}{t + 2d}$

22 Given $\frac{x-1}{4}+\frac{5}{2}=x$, calculate the value of x.

Diberi $\frac{x-1}{4}+\frac{5}{2}=x$, *hitungkan nilai x.*

A -4
B -3
C 3
D 4

23 Simplify :

Permudahkan :

$$\frac{p^{\frac{5}{3}}}{p^{\frac{4}{3}}}$$

A $\sqrt{p}$

B $\sqrt[3]{p}$

C $\frac{1}{\sqrt{p}}$

D $\frac{1}{\sqrt[3]{p}}$

24 Simplify:

Permudahkan:

$$\frac{p^3\times(256q^8)^{\frac{1}{4}}}{(16p^2q^6)^{\frac{1}{2}}}$$

A $4p^2q$
B $4p^2q^{-1}$
C p^2q
D p^2q^{-1}

25 Solve the simultaneous linear inequalities $4-x\le 8$ and $3x+4<7$.

Selesaikan ketaksamaan linear serentak $4-x\le 8$ *dan* $3x+4<7$.

A $-4\le x<1$
B $-1\le x<4$
C $-5\le x<2$
D $-4<x<1$

26 Diagram 12 is a pictograph showing the number of sales of three types of books in one week. Number of English books sold are not shown.
Rajah 12 ialah piktograf yang menunjukkan jualan tiga jenis buku dalam satu minggu. Bilangan buku Bahasa Inggeris yang telah dijual tidak ditunjukkan.

Science *Sains*	
Mathematics *Matematik*	
English *Bahasa Inggeris* .	

 *Represents 12 books*

Mewakili 12 buah buku

Diagram 12
Rajah 12

If the sales of Mathematics books were 20% of total sales in the week, calculate the number of English books sold.

Jika jualan buku Matematik ialah 20% daripada jumlah jualan minggu tersebut, hitung bilangan buku Bahasa Inggeris yang telah dijual.

A 11
B 20
C 108
D 400

27 Table 1 shows the score distribution of a group of pupils.
Jadual 1 menunjukkan taburan skor yang diperolehi oleh sekumpulan murid.

Score *Skor*	0	1	2	3
Frequency *Kekerapan*	4	*x*	4	5

Table 1
Jadual 1

Given that the value of mean is 1.5, calculate the value of *x*.
Diberi nilai min ialah 1.5, hitungkan nilai x.

A 6
B 7
C 8
D 9

28 Diagram 13 shows graf of function of $y = x^2 - 16$.

Rajah 13 menunjukkan graf bagi fungsi $y = x^2 - 16$.

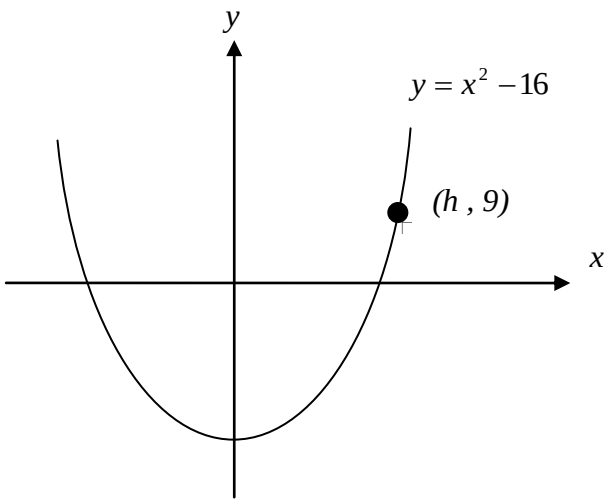


Diagram 13
Rajah 13

Find the value of *h*.
Carikan nilai h.

A 2
B 3
C 4
D 5

29 Diagram 14 is a Venn Diagram showing universal set ξ, *set P dan set Q.*
Rajah 14 ialah gambar rajah Venn yang menunjukkan set semesta ξ, *set P dan set Q.*

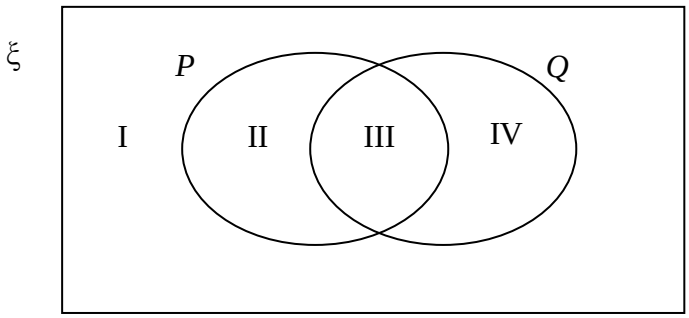


Diagram 14
Rajah 14

Kawasan yang manakah menunjukkan set Q'.
Which region represent the set Q'.

A I
B II
C I and II
I dan II
D I, II and III
I, II dan III

30 Diberi bahawa set $H = \{ 1, 3 \}$, set $J = \{ 1, 2, 3, 4, 5\}$, set $R = \{ 0, 1, 3, 5, 6, 7, 8, 9\}$ dan set $\xi = H \cup J \cup R$, cari $n(H \cup J')$.

Given that set $H = \{ 1, 3 \}$, *set* $J = \{ 1, 2, 3, 4, 5\}$, *set* $R = \{ 0, 1, 3, 5, 6, 7, 8, 9\}$ *and set* $\xi = H \cup J \cup R$, *find* $n(H \cup J')$.

A 4
B 5
C 6
D 7

31 List all the subsets of set $\{m, n\}$.
Senaraikan semua subset bagi set $\{m, n\}$.

A $\{m\}, \{n\}$
B $\emptyset, \{m\}, \{n\}$
C $\{\emptyset\}, \{m\}, \{n\}$
D $\emptyset, \{m\}, \{n\}, \{m, n\}$

32 Find the y-intercept of the straight line $-14y = -11x + 20$.

Cari pintasan-y untuk garis lurus $-14y = -11x + 20$.

A $-\frac{10}{7}$

B $-\frac{11}{14}$

C $-\frac{14}{11}$

D $\frac{10}{7}$

33 Diagram 15 shows two straight lines PQ and QR on a Cartesian plane.
Rajah 15 menunjukkan dua garis lurus PQ dan QR pada satah Cartesan.

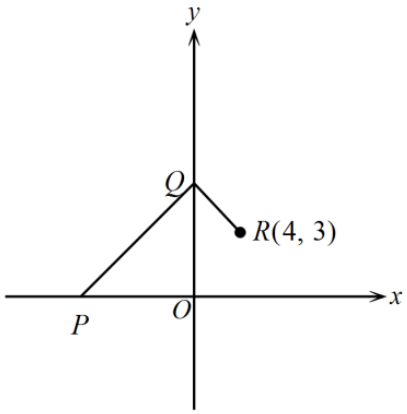


Diagram 15
Rajah 15

The length of PQ is 10 units and the gradient of QR is $-\frac{3}{4}$. Find x-intercept of PQ.

Panjang PQ ialah 10 units dan kecerunan QR ialah $-\frac{3}{4}$. *Cari pintasan-x bagi PQ.*

A -8

B -6

C 6

D 8

34 Table 2 shows the number of students participating in an Anti-drug Campaign from two schools, *S* and *T*.
Jadual 2 menunjukkan bilangan pelajar yang menyertai suatu Kempen Anti Dadah dari dua buah sekolah, S dan T.

	School S *Sekolah S*	School T *Sekolah T*
Lelaki *Boy*	20	15
Perempuan *Girl*	17	13

Table 2
Jadual 2

A student is chosen at random from the students who participated in the Anti-drug Campaign. Find the probability that a boy from School *T* will be chosen.
Seorang pelajar dipilih secara rawak daripada pelajar-pelajar yang menyertai Kempen Anti Dadah. Cari kebarangkalian seorang pelajar lelaki dari Sekolah T akan dipilih.

A $\frac{1}{5}$

B $\frac{13}{28}$

C $\frac{15}{28}$

D $\frac{3}{13}$

35 A box contains 7 white balls and 10 black balls. Yahya put another 1 white ball and 3 black balls into the box. A ball is chosen at random from the box. What is the probability that a white ball is chosen?
Sebuah kotak mengandungi 7 biji bola putih dan 10 biji bola hitam. Yahya memasukkan lagi 1 biji bola putih dan 3 biji bola hitam ke dalam kotak itu. Sebiji bola dipilih secara rawak. Apakah kebarangkalian sebiji bola putih akan dipilih?

A $\frac{7}{17}$

B $\frac{7}{8}$

C $\frac{8}{13}$

D $\frac{8}{21}$

36 It is given that $h \propto \frac{1}{q^2}$ and $h = 2$ when $q = 3$. Calculate the value of h when $q = 9$.

Diberi bahawa $h \propto \frac{1}{q^2}$ *dan* $h = 2$ *apabila* $q = 3$. *Hitung nilai h apabila* $q = 9$.

A $\frac{1}{9}$

B $\frac{2}{9}$

C $\frac{9}{2}$

D $\frac{1}{81}$

37 It is given that Y varies directly as X^2 and $Y = 4$ when $X = 1$. If $Z = \frac{5}{X}$, calculate the value of YZ when $X = 2$.

Diberi bahawa Y berubah secara langsung dengan X^2 *dan* $Y = 4$ *apabila* $X = 1$. *Jika* $Z = \frac{5}{X}$, *hitung nilai YZ apabila* $X = 2$.

A 90

B 50

C 40

D 30

38 Table 3 shows some values of the variables *d*, *x* and *y*.
Jadual 3 menunjukkan beberapa nilai bagi pembolehubah d, x, dan y.

d	**x**	**y**
4	3	p
8	6	4

Table 3
Jadual 3

Given that $d \propto \frac{x^2}{y}$, calculate the value of *p*.

Diberi bahawa $d \propto \frac{x^2}{y}$, *hitung nilai p.*

A $\frac{3}{4}$

B $\frac{2}{3}$

C 4

D 2

39 Given that $(-4n \;\; 8)\begin{pmatrix} 8 & -6 \\ -2n & -8 \end{pmatrix} = (-96 \;\; -16)$, find the value of *n*.

Diberi $(-4n \;\; 8)\begin{pmatrix} 8 & -6 \\ -2n & -8 \end{pmatrix} = (-96 \;\; -16)$, *cari nilai n.*

A 2

B $\frac{3}{2}$

C $-\frac{3}{2}$

D −2

40 $\begin{pmatrix} 8 & -3 & -6 \\ -2 & 3 & -10 \end{pmatrix}\begin{pmatrix} -3 \\ 3 \\ 5 \end{pmatrix} =$

A $\begin{pmatrix} -63 \\ 35 \end{pmatrix}$

B $\begin{pmatrix} 24 \\ -35 \end{pmatrix}$

C $\begin{pmatrix} -24 \\ -35 \end{pmatrix}$

D $\begin{pmatrix} -63 \\ -35 \end{pmatrix}$

END OF QUESTION PAPER

KERTAS SOALAN TAMAT

PENTAKSIRAN DIAGNOSTIK AKADEMIK SBP 2013

MARKING SCHEME

MATHEMATICS 1449/1

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