TEKNIK MENJAWAB MATEMATIK TAMBAHAN 2015

Pengagihan Nisbah Soalan dalam Matematik Tambahan SPM

- **R: S : T**
- **6 : 3 : 1 Kertas 1**
- **4 : 3 : 3 Kertas 2**

Mengetahui Format Kertas Soalan

Memahami Format Kertas Soalan SPM

Kertas 1 (2 jam)

(25 soalan) wajib
Aras Kesukaran R:S:T = 6:3:1

Kertas 2 (2 jam 30 min)

Bahagian A : 6 soalan wajib

Bahagian B : 5 soalan pilih 4

Bahagian C : 4 soalan pilih 2

Aras Kesukaran
R:S:T = 4:3:3

SOALAN KERTAS 1

Semua topik kecuali 4 topik di bahagian C Kertas 2 iaitu

- Pengaturcaraan Linear
- Gerakan Pada Garis Lurus
- Penyelesaian Segitiga
- Nombor Indeks

KERTAS 2

- **BAHAGIAN A (6 SOALAN, 40%)**
  - Persamaan Serentak
  - Persamaan Kuadratik / Fungsi Kuadratik
  - Pembezaan / Pengamiran
  - Statistik / Vektor
  - Sukatan Membulat
  - Indeks dan Logaritma
  - Fungsi Trigonometri
  - Janjang

KERTAS 2

BAHAGIAN B : (5 PILIH 4, 40%)

- Hukum Linear
- Pengamiran (Luas & Isipadu)
- Taburan Binomial & Taburan Normal
- Geometri Koordinat
- Fungsi Trigonometri
- Vektor
- Janjang
- Indeks dan Logaritma

KERTAS 2

BAHAGIAN C : (4 PILIH 2, 20%)

- Pengaturcaraan Linear
- Gerakan Pada Garis Lurus
- Penyelesaian Segitiga
- Nombor Indeks

9 TOPIK YANG SENANG

- Fungsi
- Persamaan Kuadratik
- Fungsi Kuadratik
- Persamaan Serentak
- Indeks dan Logaritma
- Statistik
- Hukum Linear
- Geometri Koordinat
- Nombor Indeks

Topik	Kertas 1	Kertas 2
Fungsi	9	
Persamaan Kuadratik	3	
Fungsi Kuadratik	6	
Persamaan Serentak		5
Indeks dan Logaritma	7	4
Statistik		8
Hukum Linear	4	10
Geometri Koordinat	3	7
Nombor Indeks		10
Jumlah Markah	32/80	44/100

Jumlah Markah Keseluruhan pada tahun 2011 : **42.2** %

Topik	Kertas 1	Kertas 2
Fungsi	9	
Persamaan Kuadratik	6	
Fungsi Kuadratik	3	
Persamaan Serentak		5
Indeks dan Logaritma	6	
Statistik	3	6
Hukum Linear	4	10
Geometri Koordinat	6	10
Nombor Indeks		10
Jumlah Markah	37/80	41/100

Jumlah Markah Keseluruhan pada tahun 2012 : **42.8** %

Topik	Kertas 1	Kertas 2
Fungsi	9	
Persamaan Kuadratik	6	
Fungsi Kuadratik	3	
Persamaan Serentak		5
Indeks dan Logaritma	6	
Statistik	3	7
Hukum Linear	4	10
Geometri Koordinat	6	10
Nombor Indeks		10
Jumlah Markah	37/80	42/100

Jumlah Markah Keseluruhan pada tahun 2013 : **43.9** %

Contoh Soalan Kertas 1

1. $f(x) = x^2 + 4x + 7$

(A) CARI NILAI MAKSIMUM ATAU NILAI MINIMUM BAGI FUNGSI

(B) NYATAKAN PERSMAAN PAKSI SIMETRI BAGI GRAF F(X).

[4 marks]

Penyelesaian

- $f'(x) = 2x + 4 = 0$ B1
- $x = -2$
- $f(-2) = (-2)2 + 4(-2) + 7 = 3$ B1

- (a) Min. Value =3 B1
- (b) x = -2 B1

SELESAIKAN.

$8^{x} = 16^{x-3}$

[3 marks]

Penyelesaian

- $8^{x} = 16^{x-3}$
- $(2^{3})^{x} = 2^{4(x-3)}$ B1
- $2^{3x} = 2^{4x-12}$
- $3x = 4x - 12$ B1
- $x = 12$ B1

$\log_5(4x - 7) = \log_5(x - 2) + 1.$

[3 marks]

Penyelesaian

$$\log_5(4x - 7) = \log_5(x - 2) + \log_5 5$$

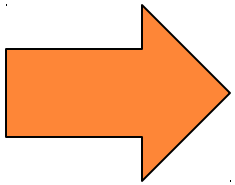
$$\log_5(4x - 7) = \log_5(x - 2)\,5 \qquad \text{B1}$$

$$(4x - 7) = (x - 2)\,5$$

$$4x - 7 = 5x - 10 \qquad \text{B1}$$

$$x = 3 \qquad \text{B1}$$

Contoh Soalan Kertas 2



PERSAMAAN SERENTAK

1 Solve the simultaneous equations $k - 3p = -1$ and $p + pk - 2k = 0$.

Give your answers correct to three decimal places. [5 *marks*]

Selesaikan persamaan serentak $k - 3p = -1$ *dan* $p + pk - 2k = 0$.

Beri jawapan anda betul kepada tiga tempat perpuluhan. [5 *markah*]

Perkara .....

① $k - 3p = -1$ —— (1)

$p + pk - 2k = 0$ —— (2)

From (1)

$k = 3p - 1$ —— (3) **P 1**

Substitute $k = 3p - 1$ into (2)

$p + p(3p-1) - 2(3p-1) = 0$

$p + 3p^2 - p - 6p + 2 = 0$

$3p^2 - 6p + 2 = 0$

$p = \dfrac{-(-6) \pm \sqrt{(-6)^2 - 4(3)(2)}}{2(3)}$ **K1**

$p = 1.577$ or $p = 0.423$

Substitute into (3)

when $p = 1.577$

$k = 3p - 1$

$= 3(1.577) - 1$

$= 3.731$ **N1**

when $p = 0.423$

$k = 3p - 1$

$= 3(0.423) - 1$

$= 0.269$

OR

From (1)

$3p = k + 1$

$p = \dfrac{k+1}{3}$ —— (3)

Substitute $p = \dfrac{k+1}{3}$ into (2) **K1**

$\dfrac{k+1}{3} + \left(\dfrac{k+1}{3}\right)k - 2k = 0$

$k + 1 + k^2 + k - 6k = 0$

$k^2 - 4k + 1 = 0$

$k = \dfrac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(1)}}{2(1)}$ **N1**

$k = 3.732$ or $k = 0.268$

Substitute into (3)

when $k = 3.732$

$p = \dfrac{k+1}{3}$

$= \dfrac{3.732 + 1}{3}$

$= 1.577$

when $k = 0.268$

$p = \dfrac{0.268 + 1}{3}$

$= 0.423$

FUNGSI KUADRATIK

Diberi fungsi kuadratik **$f(x) = -4x^2 + 2x - 3$**.

(a) Tulis fungsi kuadratik di atas dalam bentuk $f(x) = a(x+p)^2 + q$.

(b) Cari

(i) titik maksimum atau titik minimum,

(ii) persamaan paksi simetri.

(c) lakarkan fungsi kuadratik tersebut bagi domain $-1<x<2$

Penyelesian :

(a) $f(x) = -4x^2 + 2x - 3 = -4(x^2 - \frac{1}{2}x) - 3$

$= -4\left[(x-1/4)^2 - (1/4)^2\right] - 3$ **K1**

$= -4\,(x-1/4)^2 - 11/4$ **N1**

(bi) titik maksimum = $(\frac{1}{4}, -11/4)$ **N1**

(bii) $x = \frac{1}{4}$ **N1**

(c) Draw on the board

3 The gradient function of a curve is $hx^2 - kx$, where h and k are constants. The curve has a turning point at $(3, -4)$. The gradient of the tangent to the curve at the point $x = -1$ is 8.

Fungsi kecerunan suatu lengkung ialah $hx^2 - kx$, *dengan keadaan* h *dan* k *ialah pemalar. Lengkung itu mempunyai titik pusingan pada* $(3, -4)$. *Kecerunan tangen kepada lengkung itu pada titik* $x = -1$ *ialah* 8.

Find

Cari

(*a*) the value of h and of k, [5 *marks*]

nilai h *dan nilai* k, [5 *markah*]

(*b*) the equation of the curve. [3 *marks*]

persamaan lengkung itu. [3 *markah*]

Perkara .....

(3) $\frac{dy}{dx} = hx^2 - kx$

(a) Given $\frac{dy}{dx} = 0$ at $(3, -4)$

$h(3)^2 - k(3) = 0$

$9h - 3k = 0$

$3h - k = 0$ ——— (1)

Given $\frac{dy}{dx} = 8$ when $x = -1$

$h(-1)^2 - k(-1) = 8$

$h + k = 8$ ——— (2)

$3h - k = 0$ ——— (1)

$h + k = 8$ ——— (2)

$4h = 8$

$h = 2$

when $h = 2$

$h + k = 8$

$2 + k = 8$

$k = 6$

K1

K1

K1

N 1

N 1

(b) Equation of the curve

$y = \int (2x^2 - 6x)\, dx$

$= \frac{2x^3}{3} - \frac{6x^2}{2} + c$

$y = \frac{2x^3}{3} - 3x^2 + c$

$(3, -4)$: sub $x = 3$, $y = -4$

$-4 = 2\frac{(3)^3}{3} - 3(3)^2 + c$

$-4 = -9 + c$

$5 = c$

$y = \frac{2x^3}{3} - 3x^2 + 5$

K1

K1

N 1

4 (*a*) Sketch the graph of $y = \frac{3}{2}\cos 2x$ for $0 \le x \le \frac{3}{2}\pi$. [3 *marks*]

Lakar graf $y = \frac{3}{2}\,kos\ 2x$ *untuk* $0 \le x \le \frac{3}{2}\pi$. [3 *markah*]

(*b*) Hence, using the same axes, sketch a suitable straight line to find the number of solutions for the equation $\frac{4}{3\pi}x - \cos 2x = \frac{3}{2}$ for $0 \le x \le \frac{3}{2}\pi$.

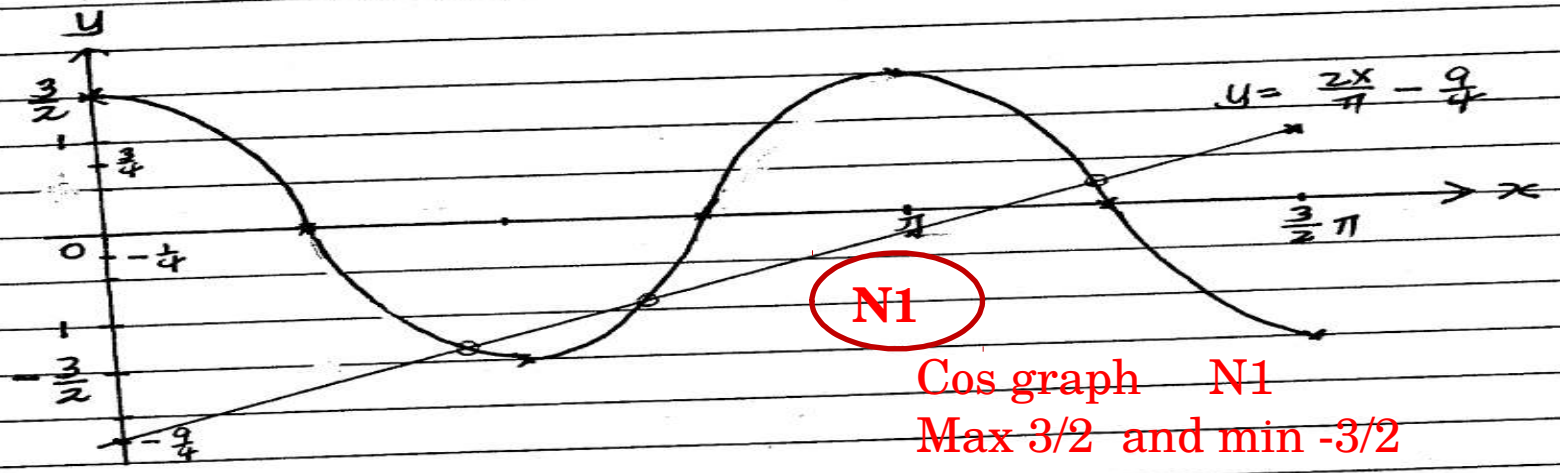
State the number of solutions. [3 *marks*]

Seterusnya, dengan menggunakan paksi yang sama, lakar satu garis lurus yang sesuai untuk mencari bilangan penyelesaian bagi persamaan $\frac{4}{3\pi}x - kos\ 2x = \frac{3}{2}$ *untuk* $0 \le x \le \frac{3}{2}\pi$.

Nyatakan bilangan penyelesaian itu. [3 *markah*]

Perkara .....

(4) (a) $y = \frac{3}{2}\cos 2x$, $0 \le x \le \frac{3}{2}\pi$



N1

Cos graph N1
Max 3/2 and min -3/2
3/2 cycles

(b) $\frac{4}{3\pi} - \cos 2x = \frac{3}{2}$

$\cos 2x = \frac{4}{3\pi}x - \frac{3}{2}$

$\frac{3}{2}\cos 2x = \frac{3}{2}\left(\frac{4}{3\pi}x - \frac{3}{2}\right)$

$y = \frac{2x}{\pi} - \frac{9}{4}$ K1

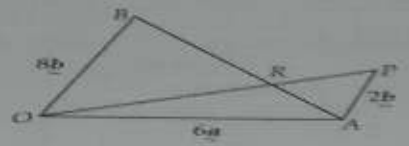
x	0	π	$\frac{3}{2}\pi$
y	$-\frac{9}{4}$	$-\frac{1}{4}$	$\frac{3}{4}$

The number of solutions = 3 N 1

VEKTOR

8 Diagram 8 shows two triangles OAB and OAP. The straight line AB intersects the straight line OP at R. Given $\overrightarrow{OA} = 6\underline{a}$, $\overrightarrow{OB} = 8\underline{b}$ and $\overrightarrow{AP} = 2\underline{b}$.

Rajah 8 menunjukkan dua buah segi tiga OAB dan OAP. Garis lurus AB bersilang dengan garis lurus OP di R. Diberi $\overrightarrow{OA} = 6\underline{a}$, $\overrightarrow{OB} = 8\underline{b}$ *dan* $\overrightarrow{AP} = 2\underline{b}$.



Diagram/*Rajah* 8

(a) Find
Cari
(i) $\overrightarrow{OP}$,
(ii) $\overrightarrow{BA}$.

[2 marks/

(b) Given that $\overrightarrow{OR} = h\overrightarrow{OP}$ *and* $\overrightarrow{BR} = k\overrightarrow{BA}$, express $\overrightarrow{OR}$,
Diberi bahawa $\overrightarrow{OR} = h\overrightarrow{OP}$ *dan* $\overrightarrow{BR} = k\overrightarrow{BA}$, *ungkapkan* $\overrightarrow{OR}$,
(i) in terms of h, $\underline{a}$ and $\underline{b}$,
dalam sebutan h, $\underline{a}$ *dan* $\underline{b}$,
(ii) in terms of k, $\underline{a}$ and $\underline{b}$.
dalam sebutan k, $\underline{a}$ *dan* $\underline{b}$.

[4 marks/

(c) Using $\overrightarrow{OR}$ from (b), find the values of h and k.
Dengan menggunakan $\overrightarrow{OR}$ *dari* (b), *cari nilai h dan k.*

[4 marks/

Answer:
Jawapan:

(a) (i) $\overrightarrow{OP} = \overrightarrow{OA} + \overrightarrow{AP}$
$= 6\underline{a} + 2\underline{b}$

(ii) $\overrightarrow{BA} = \overrightarrow{BO} + \overrightarrow{OA}$
$= -8\underline{b} + 6\underline{a}$

(b) (i) $\overrightarrow{OR} = h\overrightarrow{OP}$
$= h(6\underline{a} + 2\underline{b})$
$= 6h\underline{a} + 2h\underline{b}$

(ii) $\overrightarrow{BR} = k\overrightarrow{BA}$
$= k(6\underline{a} - 8\underline{b})$
$= 6k\underline{a} - 8k\underline{b}$

$\overrightarrow{OR} = \overrightarrow{OB} + \overrightarrow{BR}$
$= 8\underline{b} + 6k\underline{a} - 8k\underline{b}$
$= 8\underline{b} - 8k\underline{b} + 6k\underline{a}$
$= 6k\underline{a} + 8(1 - k)\underline{b}$

(c) $6h\underline{a} + 2h\underline{b} = 6k\underline{a} + 8(1 - k)\underline{b}$

$\therefore 6h = 6k$ and $2h = 8(1 - k)$

$h = k$

$2h = 8 - 8k$, given $h = k$

$\therefore 2k = 8 - 8k$

$10k = 8$

$k = \frac{8}{10} = \frac{4}{5}$

$h = \frac{4}{5}$

$\therefore h = \frac{4}{5}$, $k = \frac{4}{5}$

8 Use the graph paper to answer this question.

Gunakan kertas graf untuk menjawab soalan ini.

Table 8 shows the values of two variables, x and y, obtained from an experiment.

The variables x and y are related by the equation $\frac{k}{y} = \frac{p}{x} + 1$, where k and p are constants.

Jadual 8 menunjukkan nilai-nilai bagi dua pembolehubah, x dan y, yang diperoleh daripada suatu eksperimen. Pembolehubah x dan y dihubungkan oleh persamaan $\frac{k}{y} = \frac{p}{x} + 1$, *dengan keadaan k dan p ialah pemalar.*

x	1·5	2·0	3·0	4·0	5·0	6·0
y	2·502	0·770	0·465	0·385	0·351	0·328

Table 8

Jadual 8

(*a*) Based on Table 8, construct a table for the values of $\frac{1}{x}$ and $\frac{1}{y}$.

[2 *marks*]

Berdasarkan Jadual 8, bina satu jadual bagi nilai-nilai $\frac{1}{x}$ *dan* $\frac{1}{y}$.

[2 *markah*]

(*b*) Plot $\frac{1}{y}$ against $\frac{1}{x}$, using a scale of 2 cm to 0·1 unit on the $\frac{1}{x}$-axis and 2 cm to 0·5 unit on the $\frac{1}{y}$-axis.

Hence, draw the line of best fit. [3 *marks*]

Plot $\frac{1}{y}$ *melawan* $\frac{1}{x}$, *menggunakan skala* 2 cm *kepada* 0·1 *unit pada paksi-*$\frac{1}{x}$ *dan* 2 cm *kepada* 0·5 *unit pada paksi-*$\frac{1}{y}$.

Seterusnya, lukis satu garis lurus penyuaian terbaik. [3 *markah*]

(*c*) Use the graph in **8**(*b*) to find the value of

Guna graf di **8**(*b*) *untuk mencari nilai*

(i) *k*,

(ii) *p*.

[5 *marks*]
[5 *markah*]

Perkara .....

(8) (a) $\frac{1}{y}$ against $\frac{1}{x}$

$\frac{1}{x}$	0.67	0.50	0.33	0.25	0.20	0.17	N 1
$\frac{1}{y}$	0.40	1.30	2.15	2.60	2.85	3.05	N 1

(b) Refer graph.

(c) $\frac{k}{y} = \frac{p}{x} + 1$

$\frac{1}{y} = \frac{p}{kx} + \frac{1}{k}$

$\frac{1}{y} = \frac{p}{k}\left(\frac{1}{x}\right) + \frac{1}{k}$ P 1

(i) $\frac{1}{k} = c$

$\frac{1}{k} = 3.90$ K1

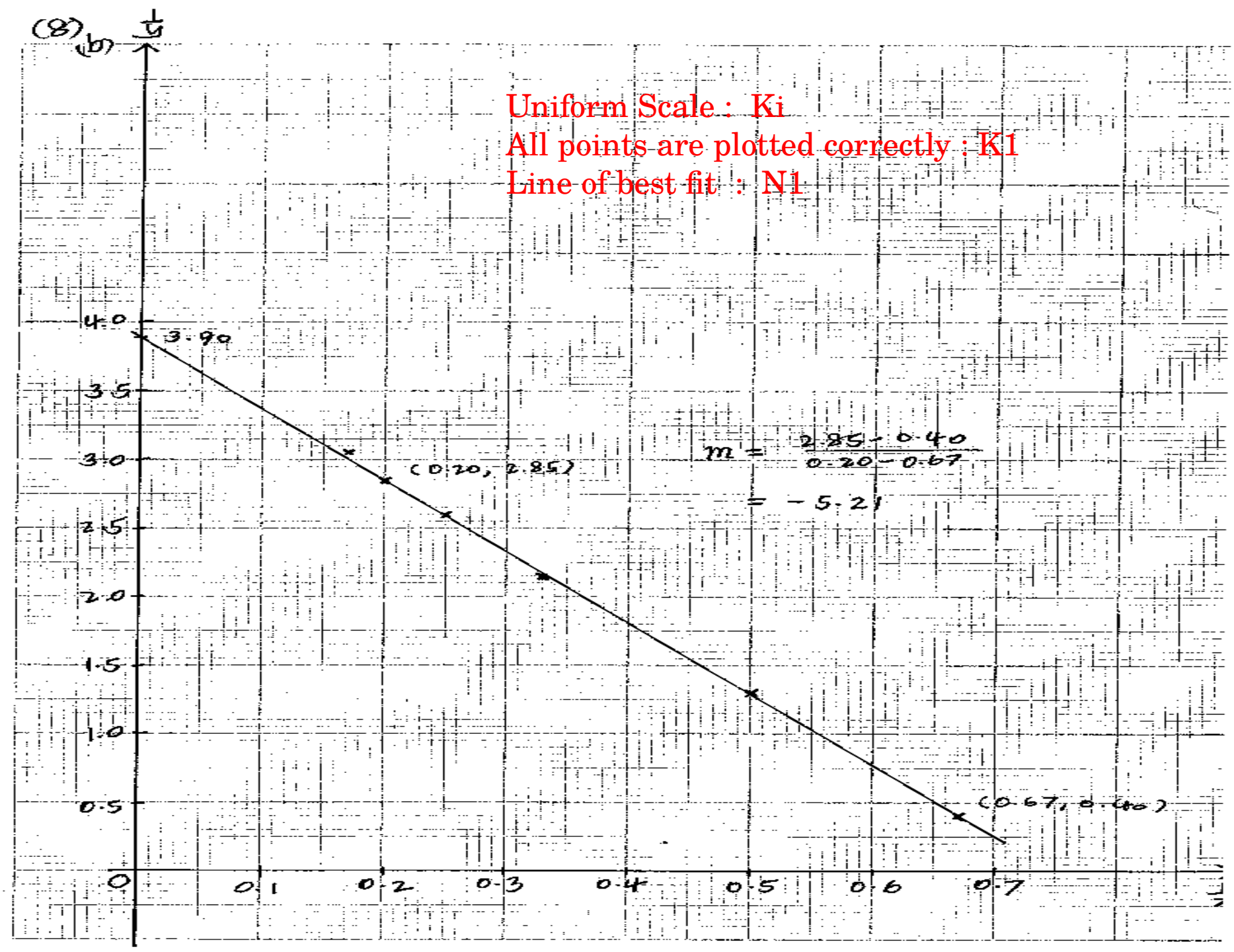
$k = 0.26$ N1

(ii) $\frac{p}{k} = m$

$\frac{p}{k} = -5.21$ K1

$\frac{p}{0.26} = -5.21$

$p = -1.34$ N1


(8) (b)
$\frac{1}{v}$
Uniform Scale : Ki
All points are plotted correctly : K1
Line of best fit : N1
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
3.90
(0.20, 2.85)
(0.67, 0.60)
$m = \frac{2.85 - 0.40}{0.20 - 0.67}$
$= -5.21$

- **MODE**
- **REG**
- **LIN**
- **? , ? M+**
- **AC**
- **SHIFT 2**
- **A = PINTASAN-Y**
- **B = KECERUNAN**

9 Solution by scale drawing is not accepted.

Penyelesaian secara lukisan berskala tidak diterima.

Diagram 9 shows a trapezium $OABC$. The line OA is perpendicular to the line AB, which intersects the y-axis at the point Q. It is given that the equation of OA is $y = -\frac{3}{2}x$ and the equation of AB is $6y = kx + 26$.

Rajah 9 menunjukkan sebuah trapezium OABC. Garis OA berserenjang dengan garis AB yang bersilang dengan paksi-y pada titik Q. Diberi bahawa persamaan OA ialah $y = -\frac{3}{2}x$ *dan persamaan AB ialah* $6y = kx + 26$.

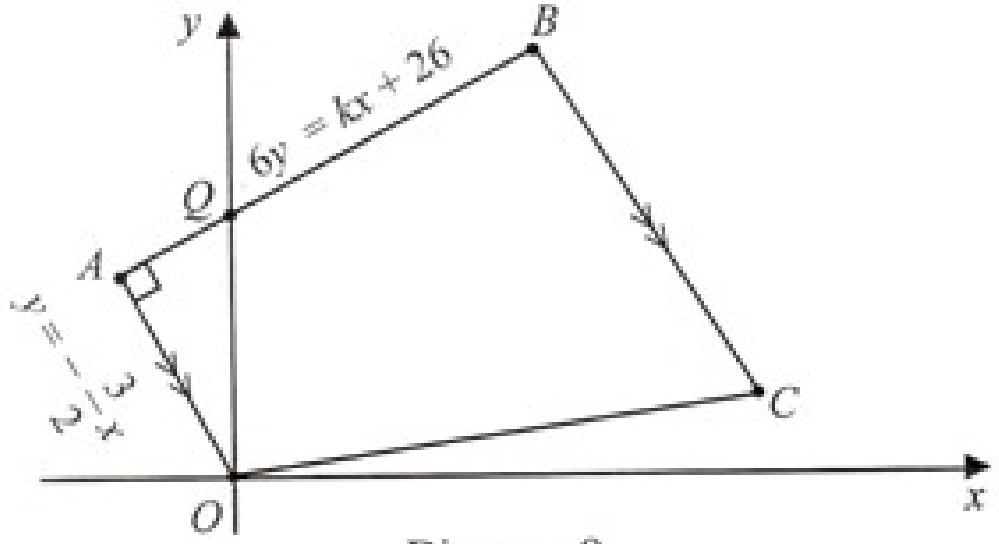


Diagram 9
Rajah 9

(a) Find
Cari

(i) the value of k,

nilai k,

(ii) the coordinates of A.

koordinat A.

[4 *marks*]
[4 *markah*]

(b) Given $AQ : QB = 1 : 2$, find
Diberi $AQ : QB = 1 : 2$, *cari*

(i) the coordinates of B,

koordinat B,

(ii) the equation of the straight line BC.

persamaan garis lurus BC.

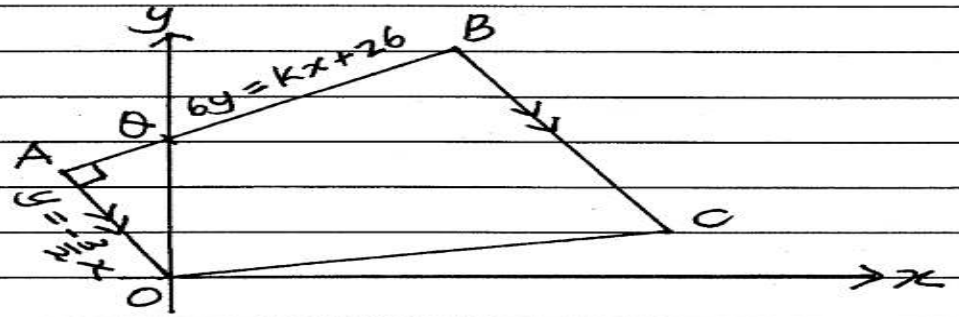
[4 *marks*]
[4 *markah*]

(c) A point $P(x, y)$ moves such that $2PA = PB$.
Find the equation of the locus of P. [2 *marks*]

Suatu titik $P(x, y)$ *bergerak dengan keadaan* $2PA = PB$.
Cari persamaan lokus P. [2 *markah*]

Perkara .....

(9)



(a) $m_{OA} \times m_{AB} = -1$ perpendicular.

(i)

$m_{OA} = -\frac{3}{2}$

$m_{AB} = \frac{k}{6}$

$(-\frac{3}{2})(\frac{k}{6}) = -1$ **K1**

$-\frac{1}{4}k = -1$

$k = 4$ * **N1**

(ii) A : intersection point.

$y = -\frac{3}{2}x$ —— (1)

$6y = 4x + 26$ —— (2)

Sub $y = -\frac{3}{2}x$ into (2)

$6(-\frac{3}{2}x) = 4x + 26$ **K1**

$-9x = 4x + 26$

$-13x = 26$

$x = -2$

$y = -\frac{3}{2}x$

$= -\frac{3}{2}(-2)$

$= 3$

A(−2, 3) * **N1**

(9)

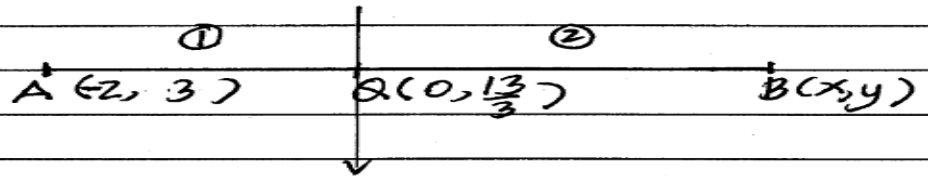
(b) Q : y-intercept ($x=0$)

(i) $6y = 26$

$y = \frac{26}{6}$

$= \frac{13}{3}$

$Q(0, \frac{13}{3})$



$(0, \frac{13}{3}) = (\frac{x+2(-2)}{3}, \frac{y+2(3)}{3})$ **K1**

$\frac{x-4}{3} = 0$ | $\frac{y+6}{3} = \frac{13}{3}$

$x - 4 = 0$ | $y + 6 = 13$

$x = 4$ | $y = 7$

$B(4, 7)$ * **N1**

(ii) $m_{BC} = -\frac{3}{2}$, $B(4, 7)$

$y - y_1 = m(x - x_1)$

$y - 7 = -\frac{3}{2}(x-4)$ **K1**

$= -\frac{3}{2}x + 6$

$y = -\frac{3}{2}x + 13$ * **N1**

(c) $2PA = PB$

$2\sqrt{(x+2)^2 + (y-3)^2} = \sqrt{(x-4)^2 + (y-7)^2}$ **K1**

$4[(x+2)^2 + (y-3)^2] = (x-4)^2 + (y-7)^2$

$4[x^2 + 4x + 4 + y^2 - 6y + 9] = x^2 - 8x + 16 + y^2 - 14y + 49$

$4(x^2 + y^2 + 4x - 6y + 13) = x^2 + y^2 - 8x - 14y + 65$

$4x^2 + 4y^2 + 16x - 24y + 52 = x^2 + y^2 - 8x - 14y + 65$

$3x^2 + 3y^2 + 24x - 10y - 13 = 0$ * **N1**

10 In Diagram 10, POQ is a sector of a circle with centre O and radius 26 cm. SRT is a quadrant of a circle with centre R and radius 5 cm.

Dalam Rajah 10, POQ *ialah sektor sebuah bulatan berpusat* O *dan berjejari* 26 cm. SRT *ialah sukuan sebuah bulatan berpusat* R *dan berjejari* 5 cm.

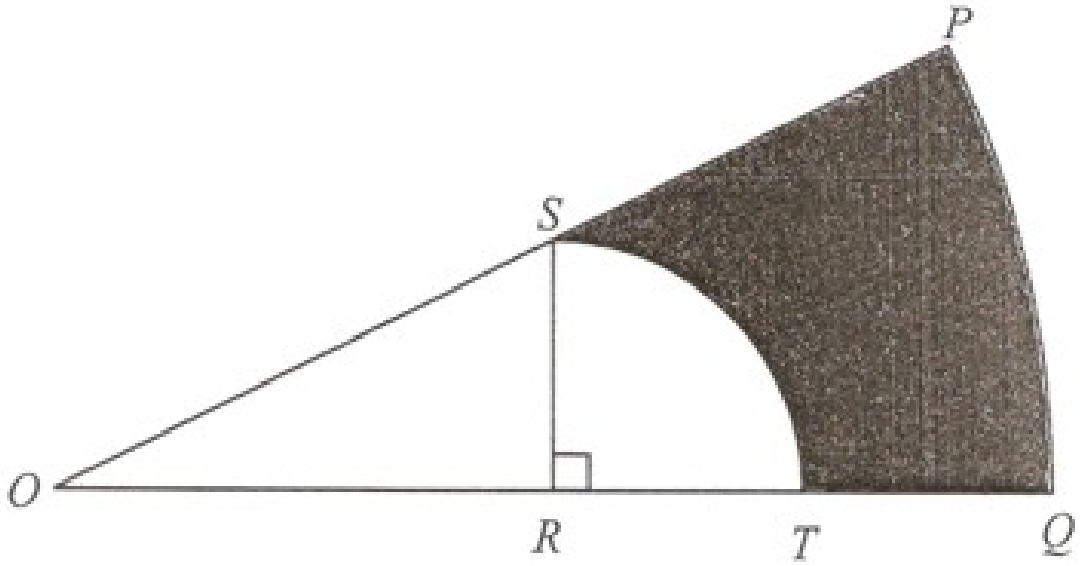


Diagram 10
Rajah 10

It is given that S is the midpoint of OP.

Use $\pi = 3{\cdot}142$ and give the answers correct to two decimal places.

Diberi bahawa S *ialah titik tengah* OP.

Guna $\pi = 3{\cdot}142$ *dan beri jawapan betul kepada dua tempat perpuluhan.*

Calculate

Hitung

(*a*) $\angle POQ$, in radian, [2 *marks*]

$\angle POQ$, *dalam radian*, [2 *markah*]

(*b*) the perimeter, in cm, of the coloured region, [4 *marks*]

perimeter, dalam cm, *kawasan berwarna*, [4 *markah*]

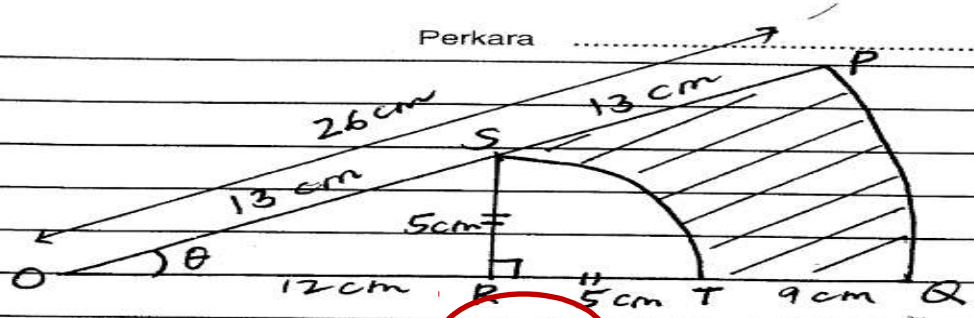
(*c*) the area, in cm^2, of the coloured region. [4 *marks*]

luas, dalam cm^2, *kawasan berwarna*. [4 *markah*]

No. Kad Pengenalan ..... Angka Giliran .....

Perkara .....

(10)



(a) $\sin\theta = \frac{5}{13}$ K1 OR $\cos\theta = \frac{12}{13}$ OR $\tan\theta = \frac{5}{12}$

$\theta = 22.62°$

$= 22.62° \times \frac{\pi}{180} = 0.3948$ rad

$= 0.39$ rad. (2 d.p.) N1

(b) Perimeter $= S_{SP} + S_{PQ} + 13 + 9_{TQ}$

$S_{SP} = r\theta$
$= (5)(\frac{\pi}{2})$ K1
$= 7.855$

$S_{PQ} = r\theta$
$= (26)(0.39)$
$= 10.14$ K1

$TQ = 26 - 12 - 5$
$= 9$

Perimeter $= 7.855 + 10.14 + 13 + 9$ K1
$= 40.00$ N1

(c) Area of the coloured region $= A_1 - A_2 - A_3$.

$A_1 = \frac{1}{2}r^2\theta$
$= \frac{1}{2}(26)^2(0.39)$
$= 131.82$ K1

$A_2 = \frac{1}{2} \times 12 \times 5$ OR $A_2 = \frac{1}{2}ab\sin C$
$= 30$ K1
$= \frac{1}{2}(12)(13)\sin 22.62°$
$= 30$
OR $A_2 = \frac{1}{2}ab\sin C$
$= \frac{1}{2}(13)(5)\sin 67.38°$
$= 30$

$A_3 = \frac{1}{2}r^2\theta$
$= \frac{1}{2}(5)^2(\frac{\pi}{2})$
$= 19.64$

Area of the coloured region $= 131.82 - 30 - 19.64$ K1
$= 82.18$ N1

Calon-calon mesti menggunakan kedua-dua belah muka

13 Table 13 shows the prices, the price indices and weightages for four types of stationery P, Q, R and S.

Jadual 13 menunjukkan harga, indeks harga dan pemberat bagi empat jenis alat tulis P, Q, R dan S.

Stationery *Alat tulis*	**Price (RM) per unit** *Harga (RM) per unit*		**Price index for the year 2008 based on the year 2007** *Indeks harga pada tahun 2008 berasaskan tahun 2007*	**Weightage** *Pemberat*
	Year 2007 *Tahun 2007*	**Year 2008** *Tahun 2008*		
P	2.80	2.10	x	4
Q	4.00	4.80	120	2
R	2.00	y	130	3
S	z	5.80	116	m

Table 13
Jadual 13

(*a*) Find the value of

Cari nilai

(i) x,

(ii) y,

(iii) z.

[3 *marks*]
[3 *markah*]

(*b*) The composite index for the price of the stationery in the year 2008 based on the year 2007 is 108·4.

Calculate the value of m. [3 *marks*]

Indeks gubahan bagi harga alat tulis tersebut pada tahun 2008 *berasaskan tahun* 2007 *ialah* 108·4.

Hitung nilai m. [3 *markah*]

(*c*) The total expenditure for the stationery in the year 2007 is RM525.

Calculate the corresponding total expenditure in the year 2008. [2 *marks*]

Jumlah perbelanjaan alat tulis tersebut pada tahun 2007 *ialah* RM525.

Hitung jumlah perbelanjaan yang sepadan pada tahun 2008. [2 *markah*]

(*d*) The price index for Q in the year 2009 based on the year 2007 is 132.

Calculate the price index for Q in the year 2009 based on the year 2008.
[2 *marks*]

Indeks harga bagi Q *pada tahun* 2009 *berasaskan tahun* 2007 *ialah* 132.

Hitung indeks harga bagi Q *pada tahun* 2009 *berasaskan tahun* 2008.
[2 *markah*]

Perkara .....

(13) (a) $I_{08/07} = \frac{Q_{08}}{Q_{07}} \times 100$

(i) $x = \frac{2.10}{2.80} \times 100$ **K1**

$= 75$ *

(ii) $130 = \frac{y}{2.00} \times 100$

$y = \frac{130 \times 2.00}{100}$

$= 2.60$ *

(iii) $116 = \frac{5.80}{z} \times 100$

$z = \frac{5.80 \times 100}{116}$ **B 2,1,0**

$= 5$ *

(b) $\bar{I}_{08/07} = 108.4$

$\bar{I} = \frac{\Sigma WI}{\Sigma W}$ **K1**

I	W	WI
75	4	300
120	2	240
130	3	390
116	m	116m
	$\Sigma W = 9+m$	$\Sigma WI = 930+116m$

K1

$\frac{930+116m}{9+m} = 108.4$ **K1**

$930+116m = 108.4(9+m)$

$= 975.6 + 108.4m$

$116m - 108.4m = 975.6 - 930$

$7.6m = 45.6$

$m = 6$ * **N1**

Perkara .....

(13) (c) Q_{07} = RM 525

Q_{08} = ?

$$\bar{I}_{08/07} = \frac{Q_{08}}{Q_{07}} \times 100$$

$$108.4 = \frac{Q_{08}}{525} \times 100 \quad \text{K1}$$

$$Q_{08} = \frac{108.4 \times 525}{100}$$

$$= \underline{569.10}\ * \quad \text{N1}$$

(d) $I_{09/07} = 132$

$I_{08/07} = 120$

$I_{09/08}$ = ?

$$\frac{120}{100} \times I_{09/08} = 132 \quad \text{K1}$$

$$I_{09/08} = \frac{132 \times 100}{120}$$

$$= \underline{110}\ * \quad \text{N1}$$

OR

$I_{09/07} = 132$

$$\frac{Q_{09}}{4.00} \times 100 = 132$$

$$Q_{09} = 5.28$$

Therefore,

$$I_{09/08} = \frac{Q_{09}}{Q_{08}} \times 100$$

$$= \frac{5.28}{4.80} \times 100$$

$$= \underline{110}$$

OR

$I_{09/07} = 132$

$$\frac{Q_{09}}{Q_{07}} \times 100 = 132$$

$$\frac{Q_{09}}{Q_{07}} = \frac{132}{100}$$

$I_{08/01} = 120$

$$\frac{Q_{08}}{Q_{07}} \times 100 = 120$$

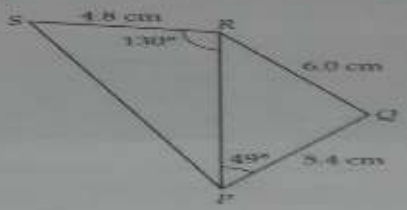
$$\frac{Q_{08}}{Q_{07}} = \frac{120}{100}$$

Therefore, $I_{09/08} = \frac{Q_{09}}{Q_{07}} \times \frac{Q_{07}}{Q_{08}} \times 100$

$$= \frac{132}{100} \times \frac{100}{120} \times 100$$

$$= \underline{110}$$

14 Diagram 14 shows a quadrilateral $PQRS$.
Rajah 14 menunjukkan sebuah sisi empat PQRS.



Diagram/*Rajah* 14

Calculate
Hitung

(a) the length, in cm, of PR,
panjang, dalam cm, PR,

[3 marks/ marks]

(b) the length, in cm, of PS,
panjang, dalam cm, PS,

[3 marks/ marks]

(c) the area of triangle PRT, in cm^2, if the point T lies on PS such that $RS = RT$.
luas segi tiga PRT, dalam cm^2, jika titik T terletak pada PS dengan keadaan RS = RT. HOTS/KBAT

[4 marks/ marks]

Answer:
Jawapan:

(a) $\frac{\sin 49°}{6} = \frac{\sin R}{5.4}$

$\sin R = 0.6792$

$R = 42.78°$

$\angle Q = 180° - 49° - 42.78°$

$= 88.22°$

$\frac{PR}{\sin 88.22°} = \frac{6.0}{\sin 49°}$

$PR = 7.95$ cm

(b) $PS^2 = PR^2 + SR^2 - 2(PR)(SR)\cos 130°$

$= 7.95^2 + 4.8^2 - 2(7.95)(4.8)\cos 130°$

$= 135.30$

$PS = 11.63$ cm

(c) $\frac{\sin \angle PSR}{7.95} = \frac{\sin 130°}{11.63}$

$\sin \angle PSR = 0.5237$

$\angle PSR = 31.58°$

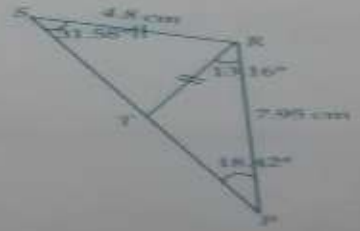
$\angle RPS = 180° - 130° - 31.58°$

$= 18.42°$

$\angle PRT = 31.58° - 18.42° = 13.16°$

Area of $\angle PRT = \frac{1}{2} \times 4.8 \times 7.95 \times \sin 13.16°$

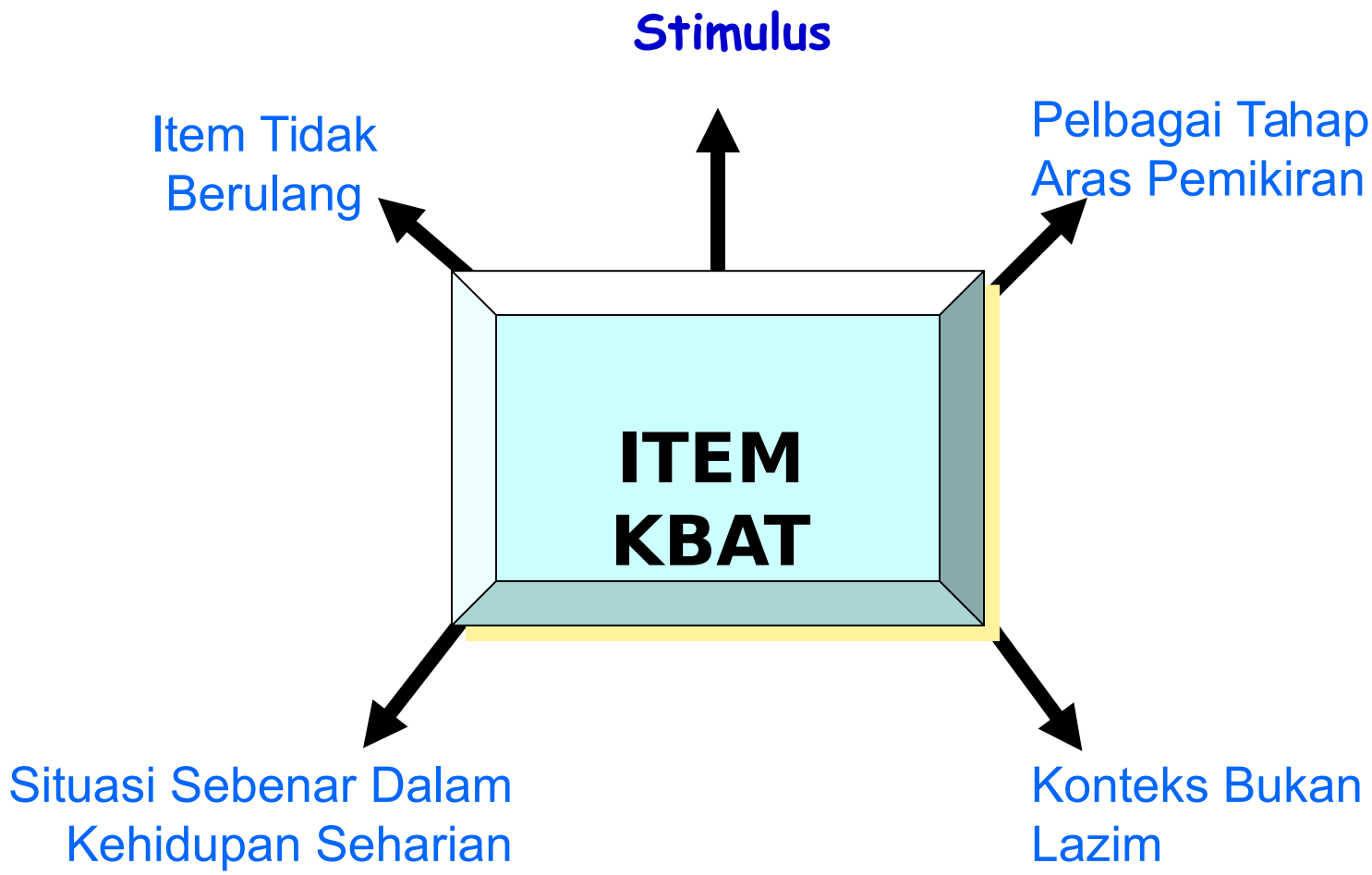
$= 4.344\ cm^2$



ITEM KBAT
(KEMAHIRAN BERFIKIR ARAS TINGGI)

- **2014 : 20 %**
- **2015 : 30 %**
- **2016 : 50 %**

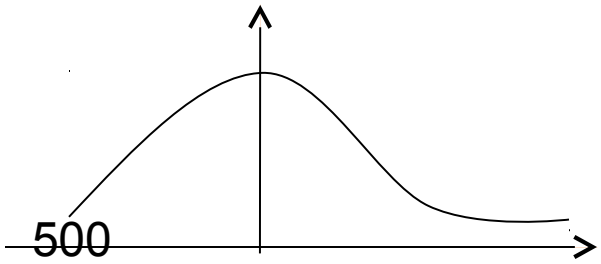
Item KBAT
(Kemahiran Berfikir Aras Tinggi)



Contoh-Contoh Item KBAT

Probability Distribution

Students' intake to a certain university is determined by a certain test. The test follows a normal distribution as described by a diagram below and the standard deviation is given by 100.



Only 15 % of the students were selected to the university. Ahmad sat for the test and obtained 590 marks. Can Ahmad enter the university?

(a) Swee Lin sit for the test. What is the minimum mark that Swee Lin will be obtained so that she is in the highest 5 %.

Sekian Terima Kasih