

MODUL TOPIKAL

SOALAN PERCUBAAN SPM

2024

TOPIK TINGKATAN 4
BAB 1

FUNGSI
(FUNCTIONS)

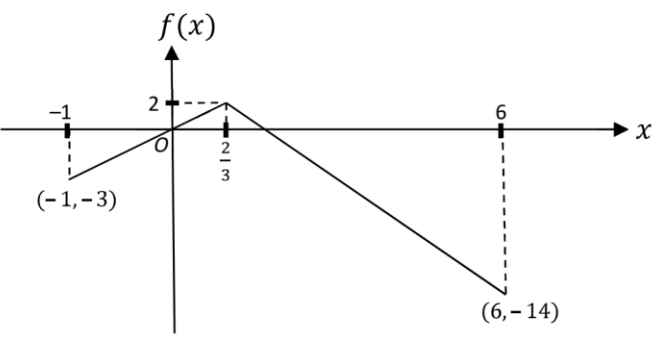
SUMBER SOALAN:
SOALAN – SOALAN PERCUBAAN SPM NEGERI
TAHUN 2024

SKEMA JAWAPAN

DISUSUN OLEH:
PN. NOORUL HUDA BINTI MOHD HASHIM
(SMK TAMAN TASIK, TAIPING)

PN ZAINAB BINTI ABD RAHMAN
(SMK CONVENT, TAIPING)

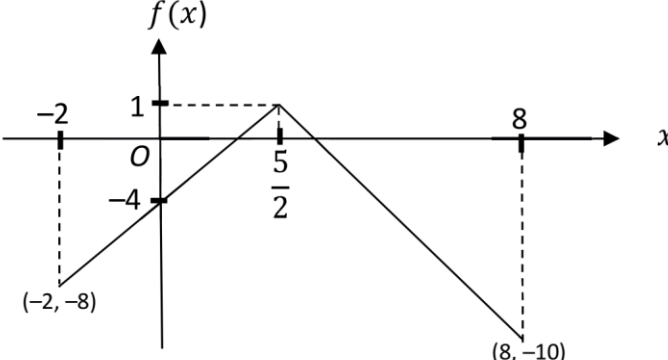
SOALAN 1: SOALAN MODUL PINTAS SELANGOR SET 1 2024 (KERTAS 1)

a	i	$ 3(-1) - 2 $ atau $ 3(6) - 2 $ 5 dan 16	K1 N1
	ii	 Graf bentuk $\wedge$ dilakar Titik-titik $(-1, -3)$, $(\frac{2}{3}, 2)$ dan $(6, -14)$ dilabel	P1 P1
b		$\frac{2}{k(x)-3} = 3x + 5$	K1
		$k(x)[3x + 5] = 2 + 15 + 9x$	K1
		$k(x) = \frac{17+9x}{3x+5}, x \neq -\frac{5}{3}$	N1,N1
			8

SOALAN 2: SOALAN MODUL PINTAS SELANGOR SET 1 2024 (KERTAS 2)

a	(i)	$f^{-1}(x)$ wujud kerana $f(x)$ ialah fungsi satu kepada satu. <i>$f^{-1}(x)$ exists because $f(x)$ is a one-to-one function.</i>	P1	3
	(ii)	$y^2 = 2x - 9$ $f^{-1}(x) = \frac{x^2+9}{2}, x \geq 0$	K1 N1	
b	(i)	$g(y) = 3\left(\frac{2}{y}\right)$ $g(x) = \frac{6}{x}, x \neq 0$	K1 N1	4
	(ii)	$g^2(x) = \frac{6}{\frac{6}{x}}$ dan $g^3(x) = \frac{6}{x}$ dan $g^4(x) = \frac{6}{\frac{6}{x}}$ $2n + 1$ adalah sentiasa ganjil, $n=1,2,3,\dots$ $g(x) = \frac{6}{x}, x \neq 0$. $2n + 1$ is always odd, $n=1,2,3,\dots$ $g^{2n+1}(x) = \frac{6}{x}, x \neq 0$.	K1 N1	
				7

SOALAN 3: SOALAN MODUL PINTAS SELANGOR SET 2 2024 (KERTAS 2)

a	i	$ 5 - 2(-2) $ @ $ 5 - 2(8) $ 9 dan 11	K1 N1
	ii	 Graf bentuk $\wedge$ dilakar Titik-titik $(-2, -8)$, $(\frac{5}{2}, 1)$ dan $(8, -10)$ dilabel	P1 P1
b		$\frac{4}{k(x)+2} = 2x - 9$ $k(x)[(2x - 9)] = 4 + 18 - 4x$ $k(x) = \frac{22-4x}{2x-9}, x \neq \frac{9}{2}$	P1 K1 N1, N1
			8

SOALAN 4: SOALAN PERCUBAAN NEGERI 2024 (KERTAS)

a	i	$f^{-1}(x)$ wujud kerana $f(x)$ ialah fungsi satu kepada satu. $f^{-1}(x)$ exists because $f(x)$ is a one-to-one function.	P1
	ii	$y^2 = 3x - 5$ $f^{-1}(x) = \frac{x^2+5}{3}, x \geq 0$	K1 N1
b	i	$g(y) = 2\left(\frac{1}{y}\right)$ $g(x) = \frac{2}{x}, x \neq 0$	K1 N1
	ii	$g^2(x) = \frac{2}{x}$ dan $g^3(x) = g(x) = \frac{2}{x}$ dan $g^4(x) = gg(x) = \frac{2}{x}$ $2n$ adalah sentiasa genap, $n = 1, 2, 3, \dots$ $g^{2n}(x) = x$. $2n$ is always even, $n = 1, 2, 3, \dots$ $g^{2n}(x) = x$.	K1 N1
			7

SOALAN 5: SOALAN PERCUBAAN NEGERI SABAH 2024 (KERTAS 1)

(a) 2	N1	3
(b) {1,4,7,10}	N1	
(c) $f: x \rightarrow 3x - 2$ @ $f(x) = 3x - 2$	N1	

SOALAN 6: SOALAN PERCUBAAN NEGERI SABAH 2024 (KERTAS 2)

a) $p = -\frac{2}{3}$	N1	7
b) $\frac{k+1}{2+3(1)} = 1$ $k = 4$	K1 N1	
c) $\frac{4+x}{2+3x} = y$ untuk cari x @ $\frac{4+y}{2+3y} = x$ untuk cari y	K1	
$f^{-1}(x) = \frac{4-2x}{3x-1}, x \neq \frac{1}{3}$	N1	
Ganti $x = 3$ ke dalam fungsi $*f^{-1}(x)$	K1	
$*-\frac{1}{4} \leq f^{-1}(x) \leq 1$	N1	
SS-1 jika tiada, $x \neq \frac{1}{3}$		

SOALAN 7: SOALAN PERCUBAAN NEGERI SEMBILAN 2024 (KERTAS 1)

(a)	$gh(x) = -4(2x-1)+2$	K1
	$gh(x) = -8x+6$	N1
(b)	$-8\left(\frac{x}{2}\right)+6=2$	K1
	$x=1$	N1
		4

SOALAN 8: SOALAN PERCUBAAN NEGERI SEMBILAN 2024 (KERTAS 1)

(a)(i)		
(ii)		
Lukis graf $y=x$ dan garis lurus $y=f^{-1}(x)$ Tanda dan label titik A		K1 K1

(b)(i)	$200+3n^2=500$	K1
	$n=10$	N1
(b)(ii)	$40q \geq 116000$ atau setara	K1
	$200+3n^2 \geq 2900$ atau setara	K1
	$n=30$	N1
		7

SOALAN 9: SOALAN PERCUBAAN NEGERI KELANTAN 2024 (KERTAS 1)

(a)	$y = \frac{2}{x+6}$	1	6
	$g^{-n}(x) = \frac{2}{x+6}, x \neq -6$	1	
(b)	$\frac{2-6y}{y} \geq 5$	1	
	Julat, $g^n(x) \leq \frac{2}{11}$	1	
(c)	$h^{-n}\left(\frac{3}{2}\right) = 3$ atau seen 3	1	
	$x = \frac{2}{11}$	1	

SOALAN 10: SOALAN PERCUBAAN NEGERI KELANTAN 2024 (KERTAS 2)

(a)	$f^2(x) = 9x + 8$ Katakan $f(x) = ax + b$, $f^2(x) = a^2x + ab + b$ atau setara Banding, $a^2 = 9$, $ab + b = 8$ $f(x) = 3x + 2$ dan $f(x) = -3x - 4$ Fungsi memenuhi syarat, $f(1) = -7$. $f(x) = -3x - 4$	1 1 1 1	8
(b) (i)	$\frac{y+1}{3}$ atau $g(x) = \frac{5\left(\frac{y+1}{3}\right)}{3} + 7$ $g(x) = \frac{5x+26}{3}$	 1 1	
(ii)	$\frac{5(p+1)+26}{3} = 2q-3$ $p = \frac{6q-40}{5}$	 1 1	

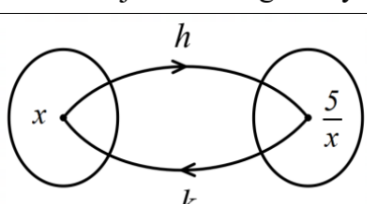
SOALAN 11: SOALAN PERCUBAAN NEGERI PERLIS 2024 (KERTAS 1)

- | | | |
|-------|--|---|
| (a) | <p>Paksi dan garis lurus 1m</p> <p>$(4,2)$ dan $(-8,-2)$ 1m</p> | 2 |
| (b) | <p>(i) $f^{-1}(x) = \frac{x+2}{3}$ 1m</p> <p>Gantikan $(-8,-2)$ atau $(4,2)$ ke dalam $f^{-1}(x) = \frac{x+2}{3}$ 1m</p> <p>$f^{-1}(x)$ ialah songsangan bagi $f(x) = 3x - 2$ 1m</p> | 3 |
| (ii) | <p>$-8 \leq x \leq 4$ 1m</p> | 1 |
| (iii) | <p>$\frac{x+2}{3} = 3x - 2$ 1m</p> <p>$x = 1$ 1m</p> | 2 |

SOALAN 12: SOALAN PERCUBAAN NEGERI KEDAH 2024 (KERTAS 1)

a)	Alternatif A $g(x) = f^{-1}(x) \quad P1$ $\frac{15}{2a+7} = x$ $a = \frac{15-7x}{2x}$ $g(x) = \frac{15-7x}{2x}, x \neq 0 \quad N1 [x \neq 0 \text{ mesti ditulis}]$ Alternatif B $fg(x) = x \quad P1$ $\frac{15}{2g(x)+7} = x$ $g(x) = \frac{15-7x}{2x}$ $g(x) = \frac{15-7x}{2x}, x \neq 0 \quad N1 [x \neq 0 \text{ mesti ditulis}]$	2
b)	$\frac{15}{2x+7} = \left(\frac{15-7x}{2x} \right)^*$ $15(2x) = (15-7x)(2x+7)$ $2x^2 + 7x - 15 = 0$ $(2x-3)(x+5) = 0$ or $14x^2 + 49x - 105 = 0$ $7[(2x-3)(x+5)] = 0$ $x = \frac{3}{2}, x = -5 \quad N1 [(2x-3)(x+5) \text{ mesti dilihat}]$	2

SOALAN 13: SOALAN PERCUBAAN NEGERI KEDAH 2024 (KERTAS 1)

	$h(x) = \frac{5}{x} @ k\left(\frac{5}{x}\right) = x$ N1		
10 a) (i)	$h(x) = k^{-1}(x) @ k\left(\frac{5}{x}\right) = h^{-1}\left(\frac{5}{x}\right)$ $@ h\left[k\left(\frac{5}{x}\right)\right] = k\left[h\left(\frac{5}{x}\right)\right]$ N1 @ $hk(x) = kh(x)$ * Terima jika murid guna ayat	2	
10 a) (ii)	 [mesti ada anak panah dan titik]	1	6
10 b)	$gf(x) = g[2x-1]$ $= \sqrt{2x-1}$ K1 Supaya $gf(x)$ tertakrif, $2x-1 \geq 0$ $2x-1 \geq 0$ K1 $x \geq \frac{1}{2}$ N1 catatan $2x-1 > 0$ K1N0	3	

SOALAN 14: SOALAN PERCUBAAN NEGERI PAHANG SET 1 2024 (KERTAS 1)

(a)	(i)	-4	N1	
	(ii)	$y^2 = 5 - x$	K1	
		$g(x) = \pm\sqrt{5-x}$, $x < 5$	N1	
(b)		Lukis bentuk v terbalik dengan betul Pintasan-x , domain betul dan $(-2, -4), (2, 0), (4, -4)$ dilihat	P1 P1	
		$-4 \leq f(x) \leq 0$	N1	
				6

SOALAN 15: SOALAN PERCUBAAN NEGERI PAHANG SET 1 2024 (KERTAS 1)

(a)		-5	N1
(b)		$\frac{3-x}{2}$	P1
		$-1 - 2\left(\frac{3-x}{2}\right)$	K1
		$g(x) = x - 4$	N1
(c)		$(x-4) - 4$	K1
		$g^2(x) = x - 8$	NI
		$g^3(x) = (x-4) - 8 // (x-8) - 4$ DAN $g^4(x) = (x-8) - 8 // (x-4) - 12 // (x-12) - 4$	K1
		$g^2(x) = x - 2(4)$ DAN $g^3(x) = x - 3(4)$ DAN $g^4(x) = x - 4(4)$ DAN $g^{30}(x) = x - 30(4)$ DAN $g^{30}(x) = x - 120$	N1

MODUL TOPIKAL

SOALAN PERCUBAAN SPM 2024

TOPIK TINGKATAN 4
BAB 2

FUNGSI KUADRATIK
(*QUADRATIC FUNCTIONS*)

SUMBER SOALAN:
SOALAN – SOALAN PERCUBAAN SPM NEGERI
TAHUN 2024

SKEMA JAWAPAN

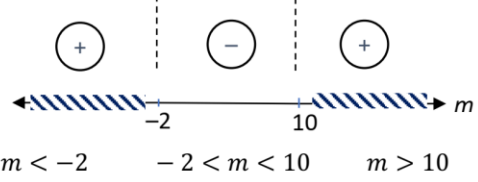
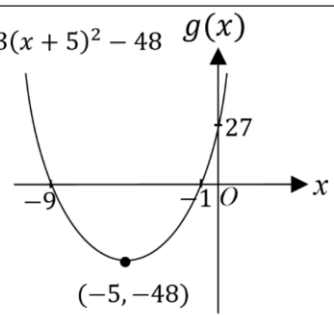
DISUSUN OLEH:
PN. NOORUL HUDA BINTI MOHD HASHIM
(SMK TAMAN TASIK, TAIPING)

PN ZAINAB BINTI ABD RAHMAN
(SMK CONVENT, TAIPING)

SOALAN 1: SOALAN MODUL PINTAS SELANGOR SET 1 2024 (KERTAS 1)

a	$t = \frac{5}{x} @ \frac{5}{t+\frac{5}{60}} = x - 2 @ \text{setara}$ $\frac{5}{x-2} = \frac{5}{x} + \frac{3}{60}$ $x^2 - 2x - 200 = 0$ $\frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(-200)}}{2(1)}$ 15.18	P1	
		K1	
		K1	
		N1	
b	$\alpha + \beta = -\left(\frac{-4}{3}\right) \text{ dan } \alpha\beta = \frac{9}{3}$ $\frac{1}{\alpha} + \frac{1}{\beta} = \left(\frac{4}{3}\right) @ \left(\frac{1}{\alpha}\right)\left(\frac{1}{\beta}\right) = \frac{1}{3}$ $9x^2 - 4x + 3 = 0$	P1	
		K1	
		N1	
		7	

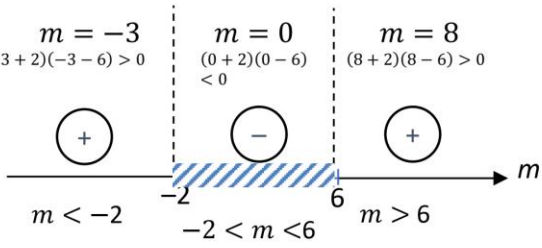
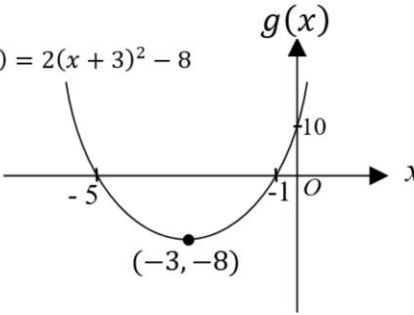
SOALAN 2: SOALAN MODUL PINTAS SELANGOR SET 1 2024 (KERTAS 2)

a	$(m - 4)^2 - 4(1)(9) > 0$ $(m + 2)(m - 10) > 0$ Titik Ujian: $m = -3$ $m = 0$ $m = 12$ $(-3 + 2)(-3 - 10) > 0$ $(0 + 2)(0 - 10) < 0$ $(12 + 2)(12 - 10) > 0$  $m < -2$ $-2 < m < 10$ $m > 10$ Nota : Terima semua titik ujian yang betul dalam julat yang sepadan $m < -2, m > 10$	K1	
		K1	
		N1	3
b	(i) $g(x) = 3(x + 5)^2 - 48$ $g(x)$  Bentuk  Titik minimum $(-5, -48)$, pintasan $x = -1, -9$ dan pintasan $y = 27$ dilabel pada graf. Nota: Kedua-dua paksi-x dan paksi-y mesti dilukis dengan pembaris.	P1	
		P1	
		P1	
		P1	
(ii)	$p > 5$ $q < -48$	P1	4
		P1	
		7	

SOALAN 3: SOALAN MODUL PINTAS SELANGOR SET 2 2024 (KERTAS 1)

a	$t = \frac{150}{x} \quad @ \quad x + 10 = \frac{150}{t - \frac{20}{60}} \quad @ \text{ setara}$ $\frac{150}{x+10} = \frac{150}{x} - \frac{20}{60}$ $x^2 + 10x - 4500 = 0$ $\frac{-10 \pm \sqrt{10^2 - 4(1)(-4500)}}{2(1)}$ 62.27	P1 K1 K1 N1
b	$\alpha + \beta = -\frac{-6}{2} \quad \text{dan} \quad \alpha\beta = \frac{9}{2}$ $\alpha + 2 + \beta + 2 = 7 \quad @ \quad (\alpha + 2)(\beta + 2) = \frac{29}{2}$ $2x^2 - 14x + 29 = 0$	P1 K1 N1
		7

SOALAN 4: SOALAN MODUL PINTAS SELANGOR SET 2 2024 (KERTAS 2)

a $(m - 2)^2 - 4(1)(4) < 0$ $(m + 2)(m - 6) < 0$ Titik $m = -3$ Ujian: $-3 + 2)(-3 - 6) > 0$ $m = 0$ $(0 + 2)(0 - 6) < 0$ $m = 8$ $(8 + 2)(8 - 6) > 0$  Nota: Terima semua titik ujian yang betul dalam julat yang sepadan $-2 < m < 6$	K1 K1 N1
b i $g(x) = 2(x + 3)^2 - 8$  Bentuk $\cup$ Titik minimum $(-3, -8)$, pintasan-$x = -5, -1$ dan pintasan-$y = 10$ dilabel pada graf. Nota: Kedua-dua paksi-x dan paksi-y mesti dilukis dengan pembaris. ii $p < 3$ $q > -8$	P1 N1 P1 P1
	7

SOALAN 5: SOALAN PERCUBAAN NEGERI SABAH 2024 (KERTAS 1)

(a)		
$(1)^2 - 4(p)(-q) > 0$	K1	
$q < -\frac{1}{4p}$	N1	
(b)		
$m+n = -\frac{1}{p} @ m+n = \frac{1}{2} \text{ DAN } mn = \frac{-q}{p}$	P1	
$\frac{\left(-\frac{1}{p}\right)^2 - 2\left(\frac{-q}{p}\right)}{\left(\frac{-q}{p}\right)} @ \frac{\left(\frac{1}{2}\right)^2 - 2\left(\frac{-q}{-2}\right)}{\left(\frac{-q}{-2}\right)}$	K1	8
$\frac{m}{n} + \frac{n}{m} = \frac{1}{2q} - 2$	N1	
(c)		
$p \left(x^2 + \frac{1}{p}x + \left(\frac{\left(\frac{1}{p}\right)}{2}\right)^2 - \left(\frac{\left(\frac{1}{p}\right)}{2}\right)^2 \right) + q @$		K1
$-2 \left(x^2 - \frac{1}{2}x + \left(\frac{\left(-\frac{1}{2}\right)}{2}\right)^2 - \left(\frac{\left(-\frac{1}{2}\right)}{2}\right)^2 \right) + q$		
@		
$p \left(x + \frac{1}{2p} \right)^2 - \frac{1}{4p} + q @$		N1
$-2 \left(x - \frac{1}{4} \right)^2 + \frac{1}{8} + q$		
$\frac{1}{8} + q$		N1

SOALAN 6: SOALAN PERCUBAAN NEGERI SABAH 2024 (KERTAS 2)

ALTERNATIF A

$$\frac{5+25}{2} @ \frac{-(-12)}{2\left(\frac{2}{5}\right)}$$

$$x = 15$$

$$\frac{2}{5}(15)^2 - 12(15) + 50$$

$$-40$$

$$\frac{2}{5}\left(*15 - \frac{25}{2}\right)^2 - 12\left(*15 - \frac{25}{2}\right) + 50 @$$

$$\frac{2}{5}\left(*15 + \frac{25}{2}\right)^2 - 12\left(*15 + \frac{25}{2}\right) + 50$$

$$22.5$$

$$|*-40| + *22.5$$

$$62.5$$

ALTERNATIF B

$$\frac{2}{5}\left(x^2 - 30x + \left(\frac{-30}{2}\right)^2 - \left(\frac{-30}{2}\right)^2\right) + 50$$

$$\frac{2}{5}(x-15)^2 - 40$$

$$-40$$

$$\frac{2}{5}\left(*15 - \frac{25}{2}\right)^2 - 12\left(*15 - \frac{25}{2}\right) + 50 @$$

$$\frac{2}{5}\left(*15 + \frac{25}{2}\right)^2 - 12\left(*15 + \frac{25}{2}\right) + 50$$

$$22.5$$

$$|*-40| + *22.5$$

$$62.5$$

K1

K1

N1

K1

K1

N1

6

K1

N1

N1

K1

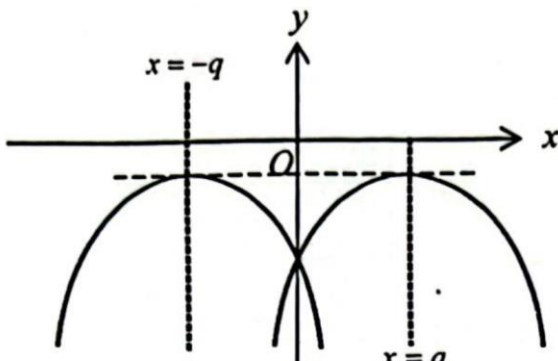
K1

N1

SOALAN 7: SOALAN PERCUBAAN NEGERI SEMBILAN 2024 (KERTAS 1)

(a)	$x^2 + \left(\frac{b}{a}\right)x + \left(\frac{b/a}{2}\right)^2 - \left(\frac{b/a}{2}\right)^2 + \frac{c}{a}$	K1
	$\left(x + \frac{b}{2a}\right)^2 - \left(\frac{b}{2a}\right)^2 + \frac{c}{a}$	K1
	$x = \frac{-b}{2a} \pm \frac{\sqrt{b^2 - 4ac}}{2a}$	N1
(b)	$\frac{-(-2k) \pm \sqrt{(-2k)^2 - 4(1)(2-k)}}{2(1)}$	K1
	$k \pm \sqrt{k^2 + k - 2}$	N1
(c)	$(k+2)(k-1) \geq 0$	K1
	$\begin{array}{ccccc} (-3+2)(-3-1) & & (0+2)(0-1) & & (2+2)(2-1) \\ \leftarrow & & & & \rightarrow \\ + & & - & & + \\ k \leq -2 & & -2 \leq k \leq 1 & & k \geq 1 \end{array}$ atau kaedah setara yang menggunakan garis nombor	K1
	$k \leq -2, k \geq 1$	N1
		8

SOALAN 8: SOALAN PERCUBAAN NEGERI SEMBILAN 2024 (KERTAS 2)

(a) (i)	$(2q)^2 - 4(-1)(-5q+1) < 0$	K1
	$p > \frac{q^2 + 1}{5}$	N1
(ii)	 Bentuk graf Pantulan paksi-y DAN simetri di $x = -q$	P1 P1
(b)	a dalam julat $-2 < a < 0$ dilihat	K1
	$h(x) = ax^2 + 3$	N1
		6

SOALAN 9: SOALAN PERCUBAAN NEGERI KELANTAN 2024 (KERTAS 1)

(a)	$\frac{-(-5) \pm \sqrt{(-5)^2 - 4(3)(3)}}{2(3)}$ $\frac{5 \pm \sqrt{11}i}{6}$ $\frac{5}{6} + \frac{\sqrt{11}i}{6} \text{ dan } \frac{5}{6} - \frac{\sqrt{11}i}{6}$	1 1 1	
(b)	$hx^2 + (k - 2h)x + h + k = 0$ atau setara $(-2h + k)^2 - 4(h)(h + k) = 0$ $h : k = 1 : 8$	1 1 1	6

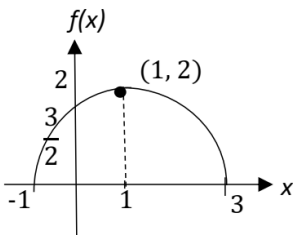
SOALAN 10: SOALAN PERCUBAAN NEGERI KELANTAN 2024 (KERTAS 2)

(a)	$10N = 0.454545... \text{ or } 1000N = 45.4545...$ $N = \frac{1}{22} \text{ and } m - n = -21$	1	
		1	
(b)	$\text{seen } \frac{\sqrt{3}}{2}$ $\frac{1}{2} \times 4j^2 \times \frac{\sqrt{3}}{2} - 3\left(\frac{j^2\pi}{6}\right) = 12\sqrt{3} - 6\pi$ $j^2 = \frac{12\sqrt{3} - 6\pi}{\sqrt{3} - \frac{\pi}{2}} \times \frac{\sqrt{3} + \frac{\pi}{2}}{\sqrt{3} + \frac{\pi}{2}}$ $\frac{36 - 3\pi^2}{3 - \frac{\pi^2}{4}} \text{ or } \frac{12(3 - \frac{\pi^2}{4})}{3 - \frac{\pi^2}{4}}$ $j = 2\sqrt{3}$	1	
		1	
		1	
		1	
		1	7

SOALAN 11: SOALAN PERCUBAAN NEGERI KELANTAN 2024 (KERTAS 2)

(a)	$(p)^2 - 4(1)(9) < 0$ $(p - 6)(p + 6) < 0$ atau  $-6 < p < 6$	1	
		1	
		1	
(b)	$f(x) = x^2 + px + \left(\frac{p}{2}\right)^2 - \left(\frac{p}{2}\right)^2 + 9$ atau $g(x) = -[x^2 - 4x + \left(-\frac{4}{2}\right)^2 - \left(-\frac{4}{2}\right)^2 - 2q]$ $f(x) = \left(x + \frac{p}{2}\right)^2 - \frac{p^2 + 36}{4}$ atau $g(x) = (x - 2)^2 + 4 + 2q$ $\frac{-p^2 + 36}{4} = 4 + 2q$ $q = \frac{20 - p^2}{8}$	1	
		1	
		1	
		1	7

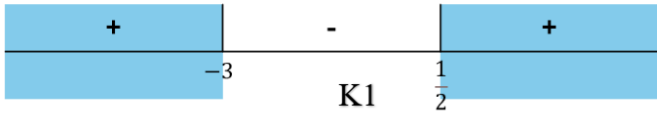
SOALAN 12: SOALAN PERCUBAAN NEGERI PERLIS 2024 (KERTAS 1)

- (a) Bentuk $\cap$ 1m
- Titik maksimum (1,2) 1m
- $(0, \frac{3}{2}), (-1, 0), (3, 0)$ 1m
- 
- 3
- (b) $f(x) = \frac{-1}{2}(x+1)^2 + 2$ 1m
- 1

SOALAN 13: SOALAN PERCUBAAN NEGERI PERLIS 2024 (KERTAS 2)

- (a) $\alpha + \beta = -4$ @ $\alpha\beta = 6$ 1m
- $\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha+\beta}{\alpha\beta} = -\frac{2}{3}$ atau $\frac{1}{\alpha} \times \frac{1}{\beta} = \frac{1}{\alpha\beta} = \frac{1}{6}$ 1m
- $6x^2 + 4x + 1 = 0$ 1m
- 3
- (b) $x^2 - 4x + 5 = m + 2x - x^2$ dan guna $b^2 - 4ac$ 1m
- $(-6)^2 - 4(2)(5-m) = 0$
- $m = \frac{1}{2}$ 1m
- $(\frac{3}{2}, \frac{5}{4})$ 1m
- 3

SOALAN 14: SOALAN PERCUBAAN NEGERI KEDAH 2024 (KERTAS 1)

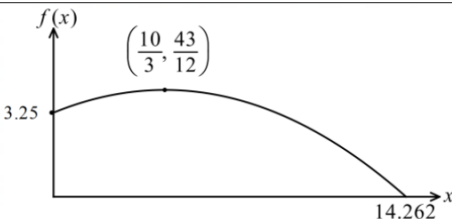
2 a)	$2x^2 + 5x - 3 \geq 0$ $(2x-1)(x+3) \geq 0$ K1 <i>Titik ujian</i> = -4 $(2(-4)-1)(-4+3)$ $9 \geq 0$ <i>Titik ujian</i> = 0 $(2(0)-1)(0+3)$ $-3 < 0$ <i>Titik ujian</i> = 1 $(2(1)-1)(1+3)$ $4 \geq 0$ Julat nilai x ialah $x \leq -3$ atau $x \geq \frac{1}{2}$ N1		3	6
2 b)	$f(x) = 2(x^2 - 6x + 5)$ $= 2 \left[x^2 - 6x + \left(-\frac{6}{2}\right)^2 - \left(-\frac{6}{2}\right)^2 + 5 \right]$ K1 $= 2(x-3)^2 - 8$ Titik minimum = (3, -8) N1 Persamaan paksi simetri, $x = 3$ N1 Nota: Tidak terima (i) $\frac{f(x)}{2}$ dan $x-3=0$		3	

SOALAN 15: SOALAN PERCUBAAN NEGERI KEDAH 2024 (KERTAS 1)

a)	$f(x) = -\frac{3}{100} \left[x^2 - \frac{20}{3}x - \frac{325}{3} \right]$ $f(x) = -\frac{3}{100} \left[x^2 - \frac{20}{3}x + \left(\frac{-\frac{20}{3}}{2} \right)^2 - \left(\frac{-\frac{20}{3}}{2} \right)^2 - \frac{325}{3} \right]$ $f(x) = -\frac{3}{100} \left[\left(x - \frac{10}{3} \right)^2 - \frac{1075}{9} \right]$ $f(x) = -\frac{3}{100} \left(x - \frac{10}{3} \right)^2 + \frac{43}{12}$ setara $f(x) = -0.03 \left(x - \frac{10}{3} \right)^2 + \frac{43}{12}$ Tinggi maksimum = $\frac{43}{12} @ 3\frac{7}{12} @ 3.583$ *K0 jika $+\left(\frac{-\frac{20}{3}}{2} \right)^2 - \left(\frac{-\frac{20}{3}}{2} \right)^2$ tidak dilihat Terima guna $f'(x)$	K1	3
----	---	----	---

13 b)	$f(9) = -\frac{3}{100}(9)^2 + \frac{1}{5}(9) + \frac{13}{4}$ $= 2.62$ Tinggi bola di atas jaring = $2.62 - 2.43$ $= 0.19$	K1 N1	2
-------	---	----------------------	---

13 c)	$x = \frac{-\left(\frac{1}{5}\right) \pm \sqrt{\left(\frac{1}{5}\right)^2 - 4\left(-\frac{3}{100}\right)\left(\frac{13}{4}\right)}}{2\left(-\frac{3}{100}\right)}$ $x = 14.262, x = -7.596 \text{ [Diabaikan]}$ Ya, kerana jarak bola mencecah lantai = $14.262 < 18$ *Mesti guna FORMULA	K1	2
-------	---	----	---

13 d)	 Graf mesti melengkung • Titik 3.25 mesti lebih rendah dari titik maksimum. • 14.262 wajib tulis		1
-------	---	--	---

SOALAN 16: SOALAN PERCUBAAN NEGERI KEDAH 2024 (KERTAS 2)

i(a)	<u>Gantikan (0,0) @ (50,0) dalam $f(x)$</u> <u>*Jika guna persamaan kuadratik bentuk pintasan ganti (25,25)</u> $0 = a(0 - 25)^2 + 25$ @ $0 = a(50 - 25)^2 + 25$ @ $25 = a(25)(25 - 50)$ K1 N1 N1 $a = -\frac{1}{25}$ $f(x) = -\frac{1}{25}x^2 + 2x$	3	
(b)	$g(x) = -\frac{1}{64} \left[x^2 - 80x + \left(\frac{-80}{2} \right)^2 - \left(\frac{-80}{2} \right)^2 \right]$ $g(x) = -\frac{1}{64} (x - 40)^2 + 25$ K1 N1 Jarak lompatan katak Q ialah 80 cm N1	2	
i(c)	Nilai a bertambah, Jarak mengufuk bertambah/Vice versa N1 Justifikasi : $a_1 < a_2 @ -\frac{1}{25} < -\frac{1}{64}$ /Vice versa N1	2	8

SOALAN 17: SOALAN PERCUBAAN NEGERI PAHANG SET 1 2024 (KERTAS 1)

(a)		$p^2 - 4(1)(3p - 5) < 0$	P1
		 atau setara	K1
		$u = 2, v = 10$	N1
(b)		Gantikan $(0, -3)$ ke dalam $y = a(x - 2)(2x + 3)$ atau setara	K1
		$y = \frac{1}{2}(x - 2)(2x + 3)$	N1

SOALAN 18: SOALAN PERCUBAAN NEGERI PAHANG SET 1 2024 (KERTAS 2)

(a)		$f(x) = a(x - 4)^2 + q$	P1
		Menggantikan $(0, 1.6)$ atau $\left(7, \frac{143}{64}\right)$ ke dalam $f(x) = a(x - 4)^2 + q$	K1
		Menyelesaikan persamaan linear serentak	K1
		$a = -\frac{29}{320}$	N1
		$q = \frac{61}{20} // 3.05$	N1
		Tidak, jaringan hanya berjaya dibuat pada ketinggian maksimum 3.05 m, bukan pada 3.2 m.	N1
(b)		Selesaikan $2 = -\frac{29}{320}(x - 4)^2 + \frac{61}{20}$	K1
		0.5961m, 7.4039m	N1
		7.4039m	N1

MODUL TOPIKAL

SOALAN PERCUBAAN SPM 2024

TOPIK TINGKATAN 4
BAB 3

SISTEM PERSAMAAN
(*SYSTEMS OF EQUATIONS*)

SUMBER SOALAN:
SOALAN – SOALAN PERCUBAAN SPM NEGERI
TAHUN 2024

SKEMA JAWAPAN

DISUSUN OLEH:
PN. NOORUL HUDA BINTI MOHD HASHIM
(SMK TAMAN TASIK, TAIPING)

PN ZAINAB BINTI ABD RAHMAN
(SMK CONVENT, TAIPING)

SOALAN 1: SOALAN MODUL PINTAS SELANGOR SET 1 2024 (KERTAS 2)

$x^2 + y^2 = 720$ @ $4x + 2y = 120$	P1	
$y = 60 - 2x$	P1	
$x^2 + *(60 - 2x)^2 = 720$	K1	
Selesaikan *persamaan kuadratik, $x^2 - 48x + 576 = 0$	K1	
$(x - 24)^2 = 0$ @ Guna formula		
$x = 24$	N1	
$y = 12$	N1	6
		6

SOALAN 2: SOALAN MODUL PINTAS SELANGOR SET 2 2024 (KERTAS 2)

$x^2 + y^2 = 500$ @ $4x + 2y = 100$	P1	
$y = 50 - 2x$	P1	
$x^2 + *(50 - 2x)^2 = 500$	K1	
Selesaikan * persamaan kuadratik, $x^2 - 40x + 400 = 0$		
$(x - 20)^2 = 0$ @ guna formula @ penyempurnaan kuasa dua	K1	
$x = 20$	N1	
$y = 10$	N1	
		6

SOALAN 3: SOALAN PERCUBAAN NEGERI SABAH 2024 (KERTAS 2)

a)		
$x + y + 5 = 15$	P1	
$y = 10 - x @ x = 10 - y$	P1	
$x^2 + 23*(10 - x) - 110 = 0 @ *(10 - y)^2 + 23y - 110 = 0$	K1	
Selesaikan *persamaan kuadratik, $b \neq 0$	K1	
----- $(x - 15)(x - 8) = 0 @ (y + 5)(y - 2) = 0$ atau kaedah lain		7
$x = 8 @ y = 2$	N1	
$y = 2 @ x = 8$	N1	
b)		
$1(8) + 10(2) = 28$		
$2(8) + 6(2) = 28$		
$3(8) + 2(2) = 28$	N1	

SOALAN 4: SOALAN PERCUBAAN NEGERI SEMBILAN 2024 (KERTAS 2)

$x = 2y - 4$ atau setara	P1
$4(2y - 4)^2 + 3y^2 - 2y(2y - 4) = 20$ atau setara	K1
$y = \frac{-(-56) \pm \sqrt{(-56)^2 - 4(15)(44)}}{2(15)}$ atau setara	K1
$y = 2.609, 1.124$	N1
$x = 1.218, -1.752$	N1
$(1.218, 2.609) \& (-1.752, 1.124)$	N1
	6

SOALAN 5: SOALAN PERCUBAAN NEGERI KELANTAN 2024 (KERTAS 1)

Hasil darab semua sebutan untuk menghapuskan satu anu
OR

Ungkapkan x dalam sebutan y dan z @

Ungkapkan y dalam sebutan x dan z @

Ungkapkan z dalam sebutan x dan y

1

Hapus anu pertama dengan pengantian OR penghapusan

1

$$x = 1 \text{ @ } y = 4 \text{ @ } z = -2$$

1

$$x = 1 \text{ DAN } z = -2 \text{ @}$$

$$y = 4 \text{ DAN } z = -2 \text{ @}$$

$$x = 1 \text{ DAN } y = 4$$

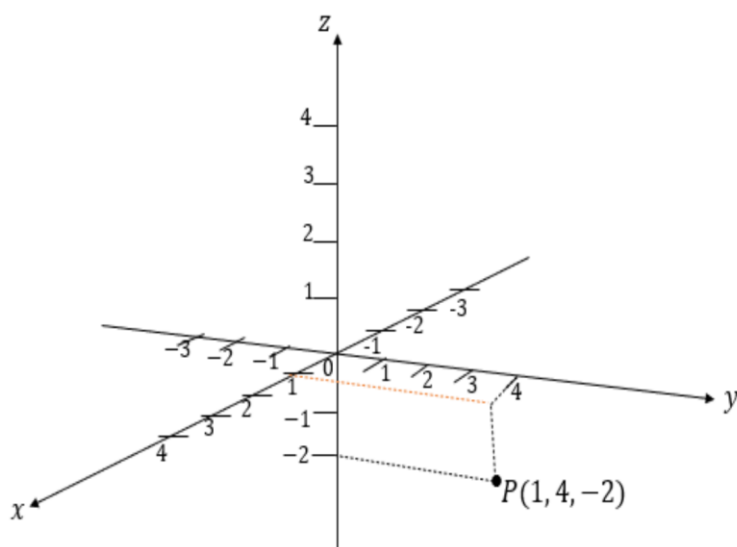
1

Label paksi- x , paksi- y dan paksi- z betul

1

Titik $P(1, 4, -2)$ ditanda betul

1



6

SOALAN 7: SOALAN PERCUBAAN NEGERI PERLIS 2024 (KERTAS 1)

$$y = -6x - 15$$

1m

Hapus satu anu (melibatkan satu persamaan linear dan satu persamaan tak linear dalam sebutan m dan n)

$$3x^2 + 9x - (-6x - 15) = 3$$

1m

Selesaikan persamaan kuadratik
 $ax^2 + bx + c = 0$ for $b \neq 0$

1m

Pemfaktoran

$$(x + 4)(x + 1) = 0$$

Rumus

$$x = \frac{-(5) \pm \sqrt{(5)^2 - 4(1)(4)}}{2(1)}$$

1m

$$x = -4 \text{ atau } x = -1$$

1m

$$y = 9 \text{ atau } y = -9$$

5

SOALAN 7: SOALAN PERCUBAAN NEGERI PERLIS 2024 (KERTAS 2)

$$x + y + z = 140$$

1m

$$25,000x + 40,000y + 50,000z = 5,150,000$$

1m

$$30,000x + 50,000y + 60,000z = 6,300,000$$

1m

Hapuskan anu pertama dengan penggantian @ penghapusan

1m

Hapuskan anu kedua dengan penggantian @ penghapusan

1m

$$x = 50 @ y = 60 @ z = 30$$

1m

$$y = 60 \text{ dan } z = 30 \text{ atau}$$

$$x = 50 \text{ dan } z = 30 \text{ atau}$$

$$y = 60 \text{ dan } z = 30$$

1m

SOALAN 8: SOALAN PERCUBAAN NEGERI KEDAH 2024 (KERTAS 2)

Membentuk persamaan linear atau persamaan tak linear

$$4x + 4y + 40 = 120 \text{ @ } 10xy = 960$$

P1

$$x = 20 - y \text{ @ } y = 20 - x \text{ @ } x = \frac{96}{y} \text{ @ } y = \frac{96}{x}$$

P1

$$10(20 - y)y = 960 \text{ atau } 10(20 - x)x = 960$$

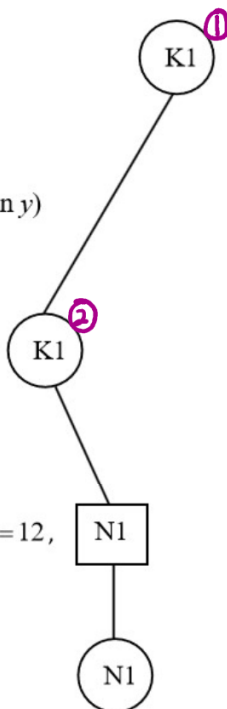
Hapuskan y atau x

(melibatkan satu persamaan linear dan
satu persamaan tak linear dalam sebutan x dan y)

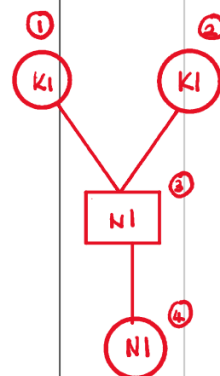
Selesaikan* kaedah persamaan kuadratik
untuk $b \neq 0$

$$x = 12, y = 8 \text{ @ } x = 8, y = 12,$$

$$x = 12, y = 8,$$



6



SOALAN 9: SOALAN PERCUBAAN NEGERI PAHANG SET 1 2024 (KERTAS 2)	
$y = 2x - 1$ or $x = \frac{y+1}{2}$	K1
$2x^2 + (2x-1)^2 - 4 = 0$ or $2\left(\frac{y+1}{2}\right)^2 + y^2 - 4 = 0$	K1
$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(6)(-3)}}{2(6)}$ or $y = \frac{-(2) \pm \sqrt{(2)^2 - 4(3)(-7)}}{2(3)}$	K1
$x = 1.115$ and $y = 1.230$	N1
$x = -0.448$ and $y = -1.896$	N1

MODUL TOPIKAL

SOALAN PERCUBAAN SPM

2024

TOPIK TINGKATAN 4
BAB 4

INDEKS, SURD & LOGARITMA
(*INDICES, SURDS & LOGARITHMS*)

SUMBER SOALAN:
SOALAN – SOALAN PERCUBAAN SPM NEGERI
TAHUN 2024

SKEMA JAWAPAN

DISUSUN OLEH:
PN. NOORUL HUDA BINTI MOHD HASHIM
(SMK TAMAN TASIK, TAIPING)

PN ZAINAB BINTI ABD RAHMAN
(SMK CONVENT, TAIPING)

SOALAN 1: SOALAN MODUL PINTAS SELANGOR SET 1(KERTAS 1)

a	$2^x(2^6) - 2^x(2^5) = 4$ $2^x = 2^{-3}$ -3	K1 K1 N1
b	$\log_2 m - \frac{\log_2 n}{\log_2 16} = 4$ $\log_2 \left(\frac{3}{\sqrt[4]{n}} \right) = 4$ $m = 16 \sqrt[4]{n}$	K1 K1 N1
c	$\frac{2 + \sqrt{5}}{2 - \sqrt{5}} \times \frac{2 + \sqrt{5}}{2 + \sqrt{5}}$ $-9 - 4\sqrt{5}$	K1 N1
		8

SOALAN 2: SOALAN MODUL PINTAS SELANGOR SET 2 (KERTAS 1)

a	$\frac{2^{2x}}{2} - 9 \left(\frac{2^x}{2^2} \right) + 1 = 0$ Anggap $2^x = u$ $(2u - 1)(u - 4) = 0$ @ $2^x = \frac{1}{2}, 2^x = 4$ $-1, 2$	K1 K1 N1
b	$\frac{\log_4 4}{\log_4 x} = 2 + \log_4 2^4$ $\frac{1}{4^4}$ $\sqrt{2}$ atau 1.414	K1 K1 N1
c	$4(2) + 2\sqrt{2} + 2\sqrt{2} + 1$ $9 + 4\sqrt{2}$	K1 N1
		8

$\log_{10} x + 2 \log_{10} y = 2 \quad @ \quad 3 \log_{10} x - \log_{10} y = 4$	K1
Selesaikan persamaan serentak $7 \log_{10} y = 2 \quad @ \quad 7 \log_{10} x = 10$	K1
$\log_{10} y = \frac{2}{7} \quad @ \quad \log_{10} x = \frac{10}{7}$	N1
$\log_{10} \sqrt{x} + \log_{10} \sqrt{y} \quad @ \quad \frac{1}{2} \log_{10} xy$	K1
$\frac{1}{2} \left(\frac{10}{7} + \frac{2}{7} \right)$	K1
$\frac{6}{7}$	N1
	6

(a) Guna hukum bahagi DAN Bandingkan *indeks $2^{2n} = 2^{1-(n-p)}$ $2n = 1 - (n - p)$ $n = \frac{p+1}{3}$	K1	5
(b) Guna hukum kuasa $5^{2np+1} = 750 - 5^{2np}$ Guna hukum darab DAN Bandingkan *indeks $5^{2np}(5^1) + 5^{2np} = 750$ $5^{2np} = 5^3$ $2np = 3$ $n = \frac{3}{2p}$	K1	
	K1	
	N1	

SOALAN 5: SOALAN PERCUBAAN NEGERI SABAH 2024 (KERTAS 1)

(a)

Guna hukum tukar asas @ hukum kuasa

K1

$$\frac{\log_2 x^2}{\log_2 4} @ \log_2 x^3$$

Guna hukum bahagi **DAN** hukum darab

K1

$$\log_2 \left[\frac{(2x-1)}{x^4} \times x^3 \right]$$

N1

$$\log_2 \left(\frac{2x-1}{x} \right)$$

6

(b)

ALTERNATIF A

Guna hukum bahagi

K1

$$\ln \left(\frac{5x}{y^2} \right) = 3 @ \log_e \left(\frac{5x}{y^2} \right) = 3$$

Tukar bentuk log kepada bentuk indeks

K1

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

$$y = \pm \sqrt{\frac{5x}{e^3}}$$

N1

ALTERNATIF B

Tukar bentuk indeks kepada bentuk log

K1

$$\ln e^3 @ \log_e e^3$$

Guna hukum darab **DAN** Banding $5x$ dengan $e^3 y^2$

K1

$$\ln(5x) = \ln(e^3 y^2) @ \log_e(5x) = \log_e(e^3 y^2)$$

$$5x = e^3 y^2$$

N1

$$y = \pm \sqrt{\frac{5x}{e^3}}$$

SOALAN 6: SOALAN PERCUBAAN NEGERI SABAH 2024 (KERTAS 1)

$\pi r^2(6) - 3\sqrt{2}\pi r^2 = 3(1 + \sqrt{8})\pi$	K1	4
$r^2 = \frac{3+6\sqrt{2}}{6-3\sqrt{2}} \times \frac{6+3\sqrt{2}}{6+3\sqrt{2}} @ r^2 = \frac{1+2\sqrt{2}}{2-\sqrt{2}} \times \frac{2+\sqrt{2}}{2+\sqrt{2}}$	K1	
$r^2 = \frac{18+9\sqrt{2}+36\sqrt{2}+18(2)}{36-9(2)} @ r^2 = \frac{2+\sqrt{2}+4\sqrt{2}+2(2)}{4-2}$	K1	
$r = \sqrt{3 + \frac{5}{2}\sqrt{2}}$	N1	
<u>Nota:</u> K1² – Pengangka dan penyebut mesti mengandungi sekurang²nya dua sebutan dengan surd K1³ – 6 sebutan bagi hasil pendaraban (4 di atas 2 di bawah)		

SOALAN 7: SOALAN PERCUBAAN NEGERI SEMBILAN 2024 (KERTAS 1)

(a)	$4x - 2(2)\sqrt{x} + 1 = 4x - 9$	K1
	$x = \frac{25}{4}$	N1
(b)	$4 = x^k$ atau $x = \sqrt[k]{4}$ atau $\frac{\log_4 4}{\log_4 x}$ atau $\log_4 x = \frac{1}{k}$	K1
	$\log_4 (4^{\frac{1}{k}})^{\frac{1}{3}}$ atau $\frac{1}{3} \log_4 x$	K1
	$\frac{1}{3k}$	N1
		5

SOALAN 8: SOALAN PERCUBAAN NEGERI SEMBILAN 2024 (KERTAS 1)

(a)	$(y - 4)\log 7 = 2x\log 3$	K1
	$y = 1.129x + 4$	N1
(b)	$2^x \times 2^5$ atau $2^x \times 2^3$ atau $2^x \times 2^2$	K1
	$2^x(36)$	K1
	36 ialah gandaan bagi 4 atau setara	N1
		5

SOALAN 9: SOALAN PERCUBAAN NEGERI KELANTAN 2024 (KERTAS 1)

(a)	$3^x \cdot 3^1 - 28(3^{\frac{x}{2}}) + 9 = 0$	1
	$(3^{\frac{x}{2}})^2 \cdot 3^1 - 28(3^{\frac{x}{2}}) + 9 = 0$	
	$(3^{\frac{x}{2}} - 9)(3(3^{\frac{x}{2}}) - 1) = 0$ atau Setara	1
	$x = 4$	1
(b)	$P = 3^a$ and $Q = 9^b$	1
	$\left(\frac{9^b}{3^a}\right)^2$	1
	3^{4b-2a}	1
		6

SOALAN 10: SOALAN PERCUBAAN NEGERI PERLIS 2024 (KERTAS 1)

(a)	$\frac{2}{\sqrt{2}-2} \times \frac{\sqrt{2}+2}{\sqrt{2}+2}$ 1m $\frac{2(\sqrt{2}+2)}{2-4}$ 1m $-\sqrt{2}-2$ 1m	3
	$\frac{\log_a hk}{\log_a a^3}$ 1m $\frac{1}{3}\log_a h + \frac{1}{3}\log_a k$ 1m	
	$\log_{a^3} 3q = 1$ 1m $q = \frac{a^3}{3}$ 1m	

SOALAN 11: SOALAN PERCUBAAN NEGERI PERLIS 2024 (KERTAS 1)

- | | | |
|-----|--|---|
| (a) | <p>Guna $\log_5 1215 = 5k + 6$ (1m)</p> <p>$5 \log_5 3 + \log_5 5 = 5k + 6$ (1m)</p> <p>$k = h - 1$ (1m)</p> | 3 |
| (b) | <p>$\log_e e^x = \log_e 8^2$ (1m)</p> <p>$x = 2m$ (1m)</p> | 2 |
| (c) | <p>Tulis $(\sqrt{2x - 3})^2 = (4 - \sqrt{2x - 1})^2$ (1m)</p> <p>$2x - 3 = 16 - 8\sqrt{2x - 1} + 2x - 1$ (1m)</p> <p>$x = \frac{97}{32} @ 3.03125$ (1m)</p> | 3 |

SOALAN 12: SOALAN PERCUBAAN NEGERI KEDAH 2024 (KERTAS 1)

$$\log_3 (x-2) - \log_3 2 = \log_3 x^2 - \log_3 (3x+4)$$

$$\log_3 \left(\frac{x-2}{2} \right) = \log_3 \left(\frac{x^2}{3x+4} \right)$$

K1 [Guna rumus log]

$$\frac{x-2}{2} = \frac{x^2}{3x+4}$$

K1

$$(x-2)(3x+4) = 2x^2$$

$$x^2 - 2x - 8 = 0$$

$$(x-4)(x+2) = 0$$

K1 [$x^2 - 2x - 8$ dilihat]

$$x = 4, x = -2 \text{ [diabaikan]}$$

N1

4

SOALAN 13: SOALAN PERCUBAAN NEGERI PAHANG SET 1 2024 (KERTAS 1)

$\log_3 (x+1) - \log_9 x^{10} + \log_3 x^4$	P1
$\log_3 (x+1) - \frac{\log_3 x^{10}}{2 \log_3 3} \log_9 x^{10} + \log_3 x^4$	K1
$\log_3 \frac{(x+1)}{x}$	N1
$\sqrt{3} = \frac{x+1}{x}$	K1
$x = \frac{1}{\sqrt{3}-1}$	K1
$x = \frac{\sqrt{3}+1}{2}$	N1

SOALAN 14: SOALAN PERCUBAAN NEGERI PAHANG SET 1 2024 (KERTAS 1)

(a)		$2\pi \left(\frac{3 + \sqrt{18}}{\sqrt{6}} \right) \times t = 2\pi (10\sqrt{2} + 5)$	P1
		$\frac{10\sqrt{12} + 5\sqrt{6}}{3 + 3\sqrt{2}} \times \frac{(3 - 3\sqrt{2})}{(3 - 3\sqrt{2})}$	K1
		$\frac{60\sqrt{12} - 60\sqrt{24} + 30\sqrt{6} - 30\sqrt{12}}{9 - 18}$	K1
		$-\frac{10}{3}\sqrt{3} + 5\sqrt{6}$	N1
(b)		$\left(3 \bullet 2^{\frac{1}{2}} \right)^2 = \left(2^{\frac{x}{2}} \right)^2 + \left(2^{x+1} \right)^2$	P1
		<u>Guna mana-mana hukum indeks</u> $2^{\frac{1}{2}(2)} \text{ ATAU } 2^2 \times 2^{2x}$	K1
		<u>Selesaikan persamaan kuadratik DAN banding indeks</u> $(y - 2)(4y + 9) = 0 \text{ DAN } 2^x = 2^1$	K1
		$x = 1$	N1

MODUL TOPIKAL

SOALAN PERCUBAAN SPM

2024

TOPIK TINGKATAN 4
BAB 5

JANJANG
(*PROGRESSIONS*)

SUMBER SOALAN:
SOALAN – SOALAN PERCUBAAN SPM NEGERI
TAHUN 2024

SKEMA JAWAPAN

DISUSUN OLEH:
PN. NOORUL HUDA BINTI MOHD HASHIM
(SMK TAMAN TASIK, TAIPING)
PN ZAINAB BINTI ABD RAHMAN
(SMK CONVENT, TAIPING)

SOALAN 1: SOALAN MODUL PINTAS SELANGOR SET 1 2024 (KERTAS 1)

a	$r_1 = \frac{9\pi}{6\pi}$ dan $r_2 = \frac{12\pi}{9\pi}$ dan $r_3 = \frac{15\pi}{12\pi}$ $r_1 \neq r_2 \neq r_3$, jujukan ini ialah bukan janjang geometri kerana nisbah sepunya, r adalah tidak sama	K1	
		N1	
b	$S_n = a + ar + ar^2 + \dots + ar^{n-1} \dots (1)$ @ $rS_n = ar + ar^2 + ar^3 + \dots + ar^n \dots (2)$ $(2) - (1)$ $rS_n - S_n = (ar + ar^2 + ar^3 + \dots + ar^n) - (a + ar + ar^2 + \dots + ar^{n-1})$ $S_n (r - 1) = a (r^n - 1)$ $S_n = \frac{a(r^n - 1)}{r - 1}$	K1	
		K1	
		N1	
			5

SOALAN 2: SOALAN MODUL PINTAS SELANGOR SET 1 2024 (KERTAS 2)

a	$\frac{\log_{\sqrt{x}} x^8}{\log_{\sqrt{x}} 9} @ \frac{\log_y y^7}{\log_y 9}$ $\frac{16 \log_{\sqrt{x}} \sqrt{x}}{\log_{\sqrt{x}} 9} @ \frac{7 \log_y y}{\log_y 9}$ $\frac{16}{s} + \frac{7}{2t}$	K1	
		K1	
		N1	
			3
b	$\log_{10} 1.043^q > \log_{10} 7$ $q > \frac{\log_{10} 7}{\log_{10} 1.043}$ 47 tahun	K1	
		K1	
		N1	
			3
			6

SOALAN 3: SOALAN MODUL PINTAS SELANGOR SET 2 2024 (KERTAS 1)

a	$r_1 = \frac{p^{12}}{p^8}$ dan $r_2 = \frac{p^{16}}{p^{12}}$ dan $r_3 = \frac{p^{20}}{p^{16}}$ $r_1 = r_2 = r_3 = p^4$, jujukan ini ialah janjang geometri kerana nisbah sepunya, r adalah sama.	K1 N1
b	$S_n = a + ar + ar^2 + \dots + ar^{n-1} \dots (1)$ $@$ $rS_n = ar + ar^2 + ar^3 + \dots + ar^n \dots (2)$ $(2) - (1)$ $rS_n - S_n = (ar + ar^2 + ar^3 + \dots + ar^n) - (a + ar + ar^2 + \dots + ar^{n-1})$ $S_n(r - 1) = a(r^n - 1)$ $S_n = \frac{a(r^n - 1)}{r - 1}$	K1 K1 N1
		5

SOALAN 4: SOALAN PERCUBAAN SPM NEGERI SABAH 2024 (KERTAS 1)

(a)		
$T_n: q(0.9)^{n-1} = 324$	P1	
	P1	
$S_n: \frac{q(1 - (0.9)^n)}{1 - 0.9} = 1084$		
Selesaikan *persamaan serentak melibatkan 2 anu	K1	
$\frac{(0.9)^n}{1 - (0.9)^n} = \frac{729}{271}$		9
$1000(0.9)^n = 729$		
$n \log_{10} 0.9 = \log_{10} 0.729$		
$n = 3$	N1	
$q = 4$	N1	
(b)		
$4(0.9)^{n-1} < 2$	K1	
$n = 8$	N1	
(c)		
$\frac{4}{1 - 0.9}$	K1	
40	N1	

SOALAN 5: SOALAN PERCUBAAN SPM NEGERI SABAH 2024 (KERTAS 2)

a) Guna $S_n = T_1 + T_2 + T_3 + \dots + T_{n-1} + T_n = a + (n-1)d$	P1	7
$S_{n1} = a + (a + d) + (a + 2d) + \dots + [a + (n-1)d] + [a + (n-1)d]$ @ $S_{n2} = [a + (n-1)d] + [a + (n-2)d] + \dots + (a + 2d) + (a + d)$ $S_{n1} + S_{n2}$ $2S_n = [2a + (n-1)d] + [2a + (n-1)d] + \dots$ $S_n = \frac{n}{2} [2a + (n-1)d]$	K1	
	N1	
b) $\frac{9}{2} [2(500) + (9-1)(-10)]$ ----- 4140 $500 + (9-1)(-10)$ ----- 420 $[*4140 + (*420 + *420 \times 50\%)] \times 8$ 38160	K1 K1 K1 N1	

SOALAN 6: SOALAN PERCUBAAN SPM NEGERI SEMBILAN 2024 (KERTAS 1)

(a)	$(-64) + (n-1)(7) < 0$ ATAU $-64, -57, -50, -43, -36, -29, -22, -15, -8, -1$	K1
	10	N1
(b)	$\frac{3}{2}(10)$ atau $n_{\text{positif}} = 15$	K1
	$\frac{15}{2} [2(6) + (15-1)(7)]$	K1
	825	N1
		5

SOALAN 7: SOALAN PERCUBAAN SPM NEGERI KELANTAN 2024 (KERTAS 1)

(a)	$S_4 = \frac{4}{2} 2a + (4-1)d = 34$ $S_{5 \rightarrow 8} = 8a + 28d = 116 @ S_{5 \rightarrow 8} = 4a + 22d = 82$ $a = 4 \text{ dan } d = 3$	1 1 1	
(b)	Tangki 1: $a = 3500$ ml dan $r = 88\% = 0.88$ Tangki 2: $a = 2700$ ml dan $r = 91\% = 0.91$ $T_n(\text{Tangki 1}) < T_n(\text{Tangki 2})$ $3500 \cdot 0.88^{n-1} < 2700 \cdot 0.91^{n-1}$ $\frac{3500}{2700} < \left(\frac{0.91}{0.88}\right)^{n-1}$ Guna hukum Log $\log_{10} \left(\frac{3500}{2700}\right) < (n-1) \log_{10} \left(\frac{0.91}{0.88}\right)$ $n > 8.7$ $n = 9$ 20 minit $\times (9-1) = 160$ minit = 2 jam 40 minit 1.00 tgh + 2 jam 40 minit = 3.40 petang	1 1 1 1 1	8

SOALAN 8: SOALAN PERCUBAAN SPM NEGERI PERLIS 2024 (KERTAS 1)

(a)	$a = 2, \quad r = -3$ $T_2 = 2(-3)^{2-1} = -6$ $T_3 = 2(-3)^{3-1} = 18$ $T_4 = 2(-3)^{4-1} = -54$	1m 1m 1m	3
(b)	Guna $\frac{2-m}{6+2m} = \frac{4-2m}{2-m}$ $m = -2$	1m 1m	3

SOALAN 9: SOALAN PERCUBAAN SPM NEGERI PERLIS 2024 (KERTAS 1)

JAWAPAN:

	Tulis	
(a)	$T_1 = \pi \left(\frac{2a}{2} \right) + 2a @ a(\pi + 2)$	
	$T_2 = \pi \left(\frac{3a}{2} \right) + 3a @ \frac{3}{2}a(\pi + 2)$	
	$T_3 = \pi \left(\frac{4a}{2} \right) + 4a @ 2a(\pi + 2)$	1m
	Guna $a(\pi + 2) + \frac{3}{2}a(\pi + 2) + 2a(\pi + 2)$	1m
	$\frac{9}{2}a(\pi + 2)$	1m
		3
(b)	Guna $\frac{3}{2}a(\pi + 2) - a(\pi + 2) = 2a(\pi + 2) - \frac{3}{2}a(\pi + 2)$	1m
	$\frac{1}{2}a(\pi + 2) = \frac{1}{2}a(\pi + 2)$	1m
	Dan	2
	Janjang Aritmetik	
(c)	Guna $T_n = 12(\pi + 2)$	1m

	$\left(\frac{n+1}{2} \right) a(\pi + 2) = 12(\pi + 2)$	
	$n = 11$	1m
		2

SOALAN 10: SOALAN PERCUBAAN SPM NEGERI KEDAH 2024 (KERTAS 1)

a)	Adib [9 bahagian] $S_9 = 213.36$ $\frac{9}{2}[2k + (9-1)h] = 213.36$ K1 [@ $\frac{16}{2}[2k + (16-1)h]$ $9k + 36h = 213.36$... (1) Azim [16 bahagian] $S_{16} = 304.80$ $\frac{16}{2}[2k + (16-1)h] = 304.80$ $2k + 15h = 38.10$... (2) $(1) \times 2 : 18k + 72h = 426.72$... (3) $(2) \times 9 : 18k + 135h = 342.90$... (4) $(4) - (3) : 63h = -83.82$ $h = -1.33$ Ganti $h = -1.33$ dalam (1) $9k + 36(-1.33) = 213.36$ K1 $k = 29.03$ Alternatif: Ganti $h = -1.33$ dalam (2) $2k + 15(-1.33) = 38.10$ $k = 29.03$ $\therefore h = -1.33, k = 29.03$ N1N1	4
b)	$T_n = 15.73$ $29.03 + (n-1)(-1.33) = 15.73$ K1 $30.36 - 1.33n = 15.73$ $n = 11$ N1 $S_{11} = \frac{11}{2}[2(29.03) + (11-1)(-1.33)]$ K1 @ $S_{11} = \frac{11}{2}[29.03 + 15.73]$ $S_{11} = 246.18$ $\therefore$ Julat ketinggian Aiman ialah $147.32 - 160.02$ cm N1	4

SOALAN 11: SOALAN PERCUBAAN SPM NEGERI KEDAH 2024 (KERTAS 2)

0(a)	$\pi x^2 h$ dan $\pi x^2 \frac{h}{2}$ dan $\pi x^2 \frac{h}{4}$ dan $\pi x^2 \frac{h}{8}$ atau $r = \frac{1}{2} / 0.5$ (P1) <u>ALTERNATIF A</u> $\pi x^2 h + \pi x^2 \frac{h}{2} + \pi x^2 \frac{h}{4} + \pi x^2 \frac{h}{8} = 480\pi$ (K1) N1 $x = \frac{16}{\sqrt{h}}$ <u>ALTERNATIF B</u> $\frac{\pi x^2 h \left[1 - \left(\frac{1}{2} \right)^4 \right]}{1 - \frac{1}{2}} = 480\pi$ (K1) N1 $x = \frac{16}{\sqrt{h}}$	3
0(b)	$x = \frac{1}{4} h$ (P1) dilihat <u>Bandingkan dan selesaikan</u> — nampak ada pergerakan pengiraan. $\frac{16}{\sqrt{h}} = \frac{1}{4} h$ $h^{3/2} = 64$ (K1) N1 16	3

SOALAN 12: SOALAN PERCUBAAN SPM NEGERI PAHANG SET 1 2024 (KERTAS 1)

(a)		$\frac{11k-5}{36} = \frac{144}{11k-5}$	K1
		Selesaikan persamaan kuadratik / <i>Solve quadratic equation</i>	K1
		7	N1
(b)		2	N1

SOALAN 13: SOALAN PERCUBAAN SPM NEGERI PAHANG SET 1 2024 (KERTAS 2)

(a)		$a + (7-1)(250) = 4a$	K1
	500		N1
(b)		$\frac{n}{2}[2(500) + (n-1)(250)] > 13500$	K1
		$(n-9)(n+12) > 0$	K1
		$n = 10$	N1
(c)		$\frac{12}{2}[2(500) + (12-1)(250)]$	K1
		$22500 \times (25-7)$	K1
		405000	N1

MODUL TOPIKAL

SOALAN PERCUBAAN SPM

2024

TOPIK TINGKATAN 4
BAB 6

HUKUM LINEAR
(*LINEAR LAW*)

SUMBER SOALAN:
SOALAN – SOALAN PERCUBAAN SPM NEGERI
TAHUN 2024

SKEMA JAWAPAN

DISUSUN OLEH:
PN. NOORUL HUDA BINTI MOHD HASHIM
(SMK TAMAN TASIK, TAIPING)
PN ZAINAB BINTI ABD RAHMAN
(SMK CONVENT, TAIPING)

SOALAN 1: MODUL PINTAS SELANGOR SET 1 2024 (KERTAS 1)

$$\ln y = 4x - 1$$

P1

$$4 = \frac{2 - (-1)}{q - 0} \quad @ \quad 2 = 4q - 1$$

K1

$$p = -1, \quad q = \frac{3}{4}$$

N1N1

4

SOALAN 2: MODUL PINTAS SELANGOR SET 1 2024 (KERTAS 2)

a

$\frac{1}{y}$	0.385	0.294	0.179	0.159	0.070
---------------	-------	-------	-------	-------	-------

N1

Rujuk pada graf

Skala betul dan memplot satu *titik dengan betul

Semua titik diplotkan dengan betul

Garis penyuuaian terbaik

K1

N1

N1

4

b

(i) $\frac{1}{y} = \frac{p}{3}x + 2q$

P1

$$\frac{p}{3} = *m$$

K1

$$p = * -0.27 \leftrightarrow -0.23$$

N1

$$2q = *c$$

K1

$$q = * 0.26 \leftrightarrow 0.28$$

N1

(ii) $\frac{1}{y} = * 0.225$

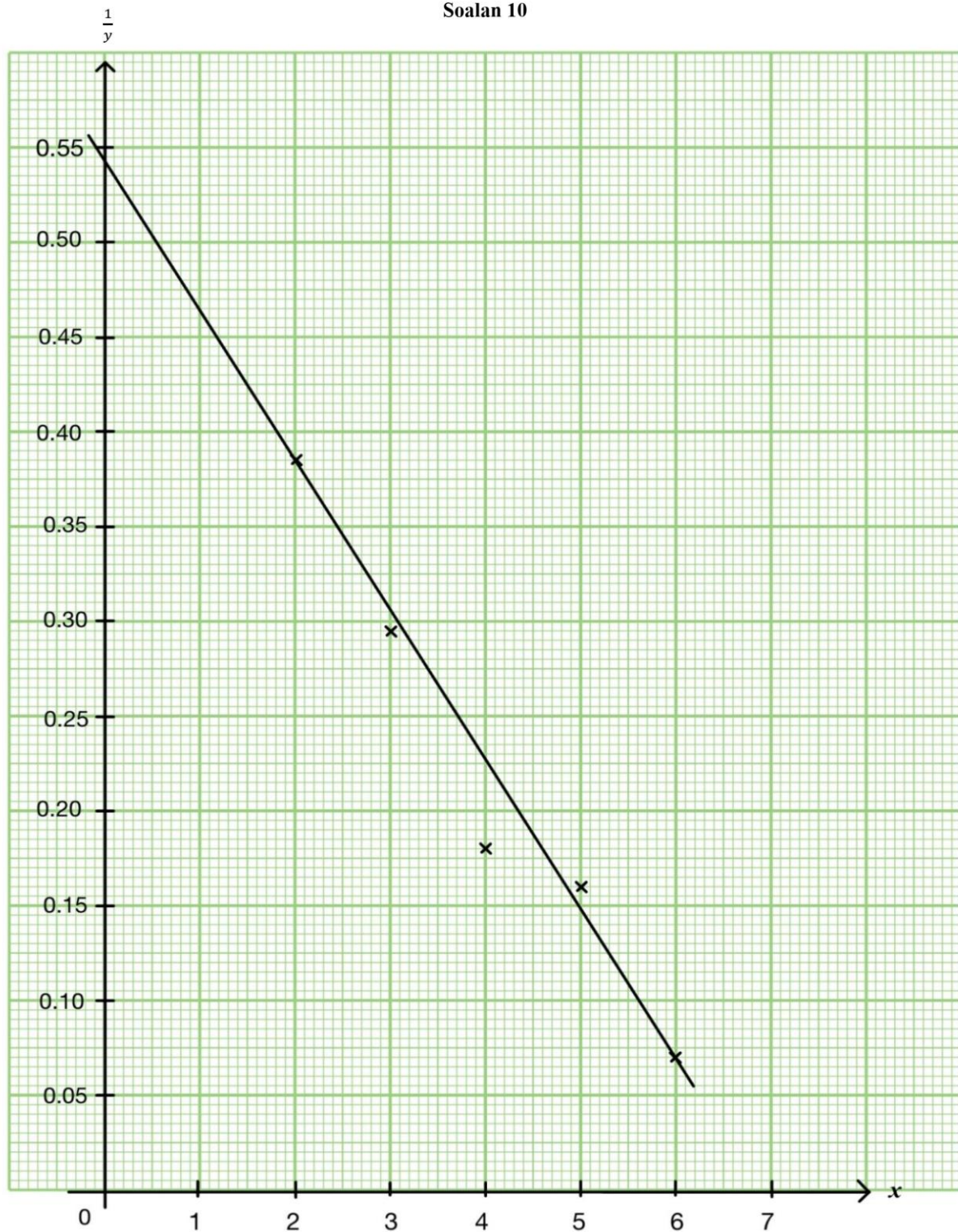
N1

$$y = 4.35 \leftrightarrow 4.44$$

6

10

Soalan 10



SOALAN 3: MODUL PINTAS SELANGOR SET 2 2024 (KERTAS 1)

$$\log_{10} y = 2x - 3$$

P1

$$2 = \frac{2-(-3)}{q-0} \quad @ \quad 2 = 2q - 3$$

K1

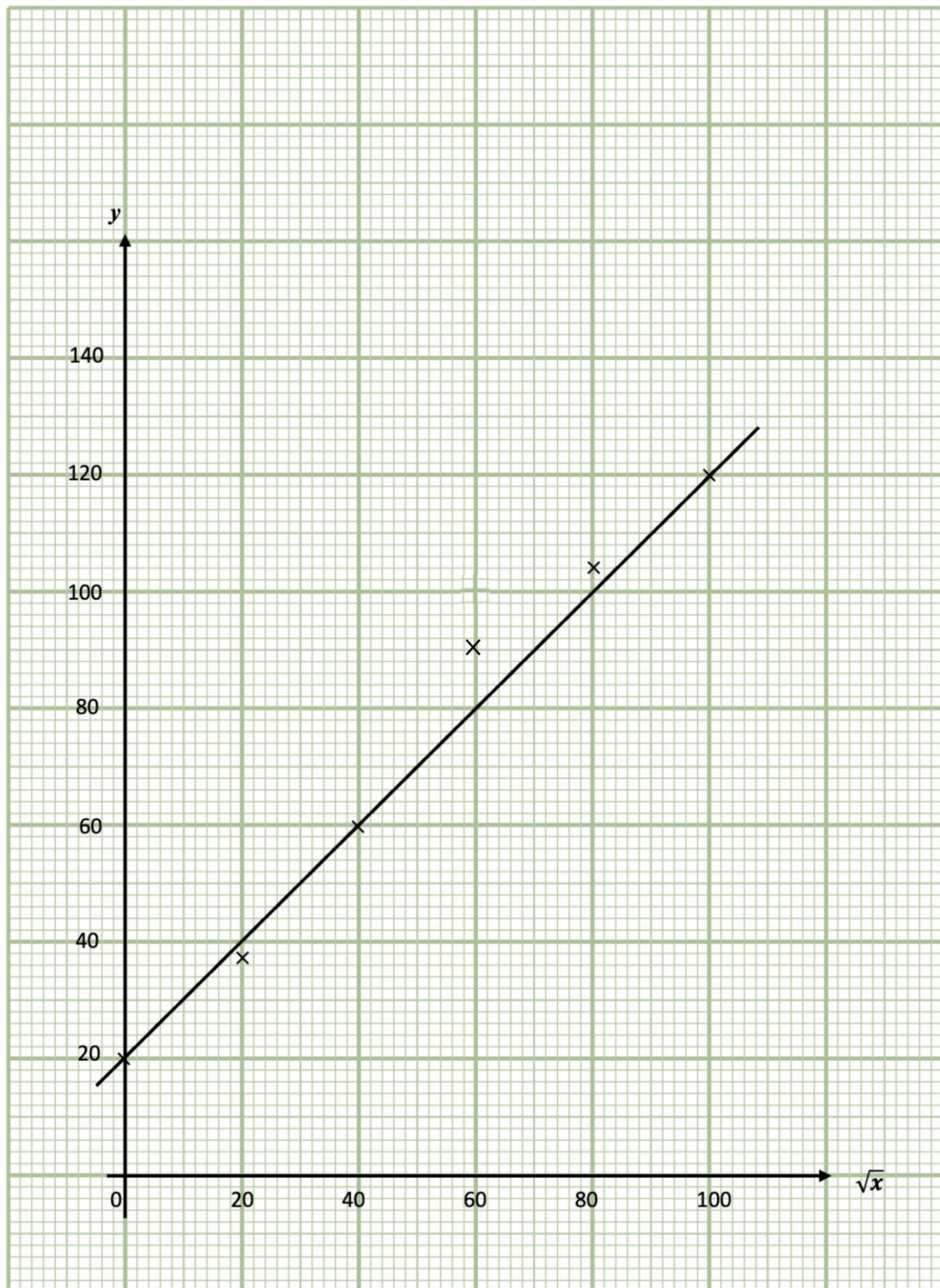
$$p = -3, \quad q = \frac{5}{2}$$

N1, N1

4

SOALAN 4: MODUL PINTAS SELANGOR SET 2 2024 (KERTAS 2)

a	<table><tr><td>$\sqrt{x}$</td><td>0</td><td>20</td><td>40</td><td>60</td><td>80</td><td>100</td></tr></table>							$\sqrt{x}$	0	20	40	60	80	100	N1
$\sqrt{x}$	0	20	40	60	80	100									
b	Rujuk pada graf Skala seragam yang betul dan melalui satu titik yang betul Semua titik diplot dengan betul Garis penyuaian terbaik							K1 N1 N1							
c	i	$y = 2p\sqrt{x} + q$ $2p = * m \ @ \ q = * c$ $p = 0.5 \leftrightarrow 0.52$ $q = 20 \leftrightarrow 20.1$						P1 K1 N1 N1							
	ii	$y = 50$						N1							
	iii	$y = 80$						N1							
								10							



SOALAN 5: SOALAN PERCUBAAN SPM NEGERI SABAH 2024 (KERTAS 1)

(a)

$$\frac{y}{x^3} = \frac{b}{x^2} - 7$$

P1

(b)

ALTERNATIF A

$$\frac{b}{8} = -7k + b \text{ or } hk = -7h + b$$

K1

$$hk + 7h = 8k$$

K1

$$h = \frac{8k}{k+7}$$

N1

ALTERNATIF B

$$\frac{\frac{b-b}{8}}{k-0} = -7 @ \frac{\frac{hk-\frac{b}{8}}{h-k}}{h-k} = -7 @ \frac{\frac{hk-b}{h-0}}{h-0} = -7$$

K1

$$\frac{\frac{hk-\frac{8k}{8}}{h-k}}{h-k} = -7 @ \frac{\frac{hk-8k}{h-0}}{h-0} = -7$$

K1

$$h = \frac{8k}{k+7}$$

N1

4

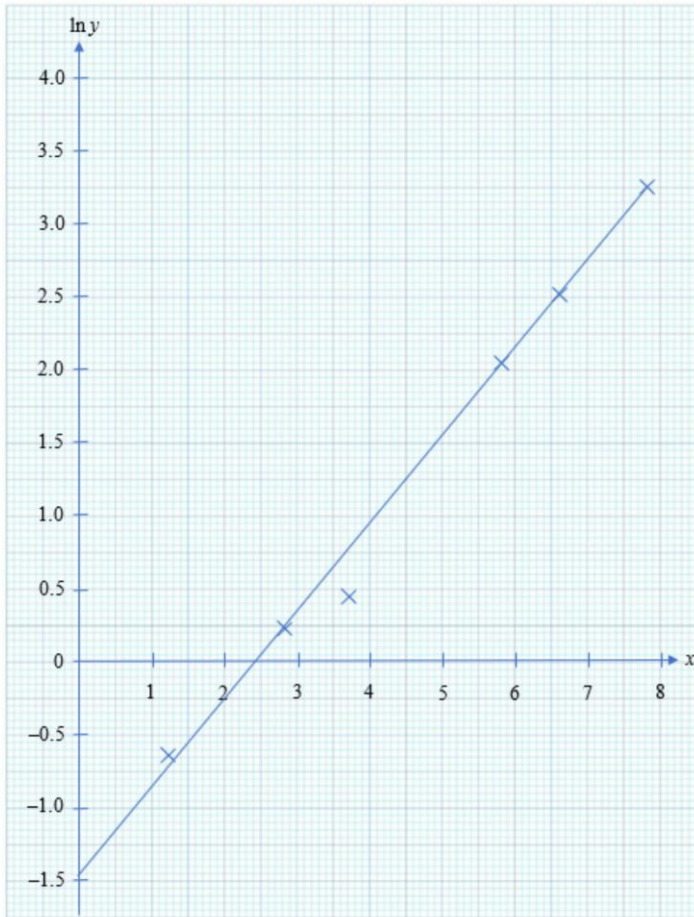
SOALAN 6: SOALAN PERCUBAAN SPM NEGERI SABAH 2024 (KERTAS 2)

a)

x	1.2	2.8	3.7	5.8	6.6	7.8
$\ln y$	-0.65	0.22	0.44	2.04	2.52	3.24

N1

b)



Graf garis lurus $\ln y$ melawan x dilukis

- Paksi-paksi betul dan skala seragam dari titik pertama sehingga titik terakhir
- Sekurang-kurangnya satu *titik diplot betul
- 6 *titik diplot dengan betul
- Garis lurus penyuaian terbaik

K1

N1

N1

c)i)

$$\ln y = \frac{m}{n}x + n$$

$$n = -1.45 \pm 0.05$$

P1

N1

c)ii)

$$\text{Cari *kecerunan} = \frac{m}{n}$$

(Dua *titik diambil dari garis lurus penyuaian terbaik)

K1

$$m = -0.7975$$

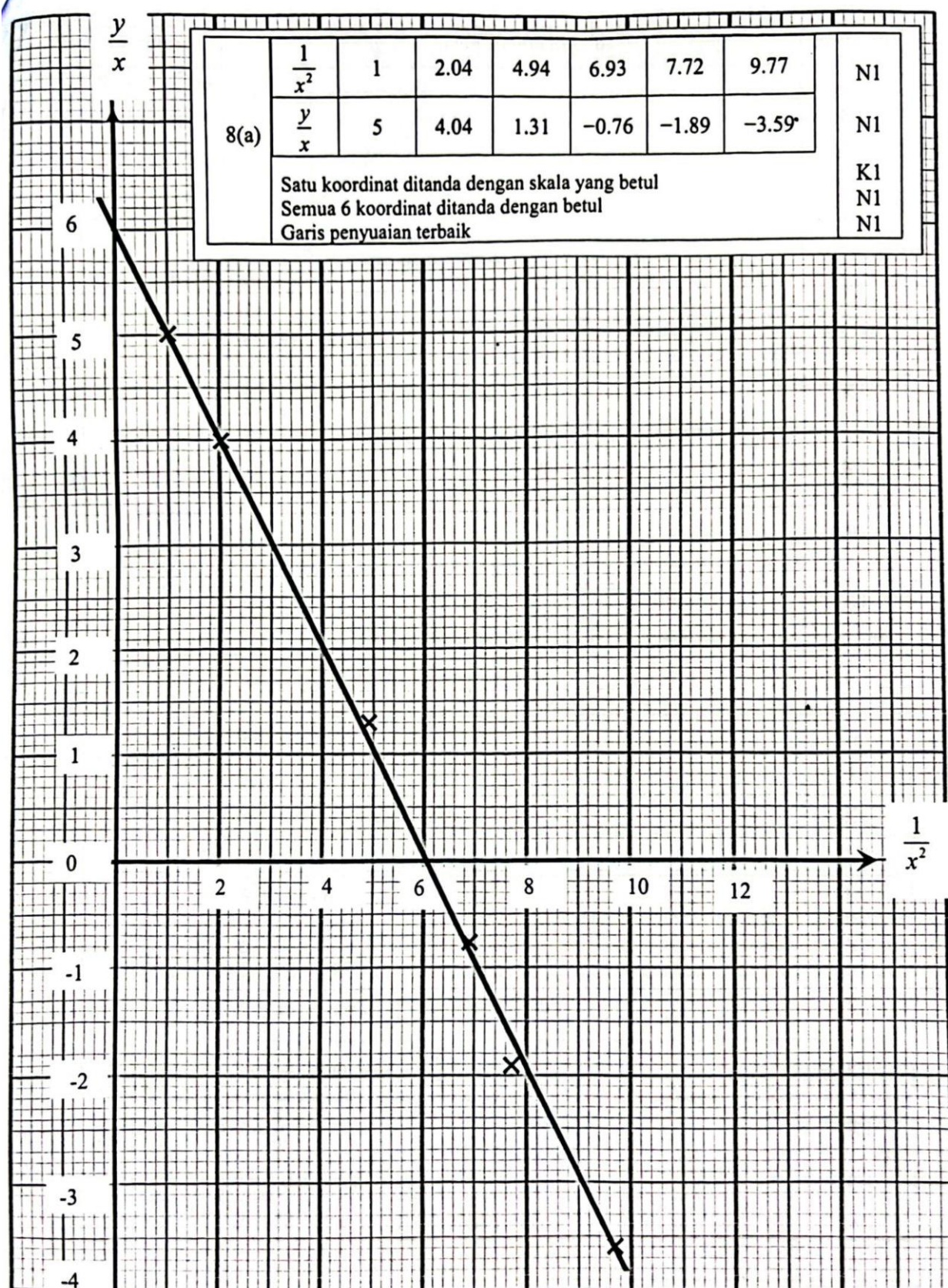
N1

SOALAN 7: SOALAN PERCUBAAN SPM NEGERI SEMBILAN 2024 (KERTAS 1)

(a)	$y - x^2 = 4x + 4$	P1
	$Y = y - x^2$	N1
(b)	$\frac{5-4}{h-0} = 4$ atau $5 = 4(h) + 4$	K1
	$h = \frac{1}{4}$	N1
		4

SOALAN 8: SOALAN PERCUBAAN SPM NEGERI SEMBILAN 2024 (KERTAS 2)

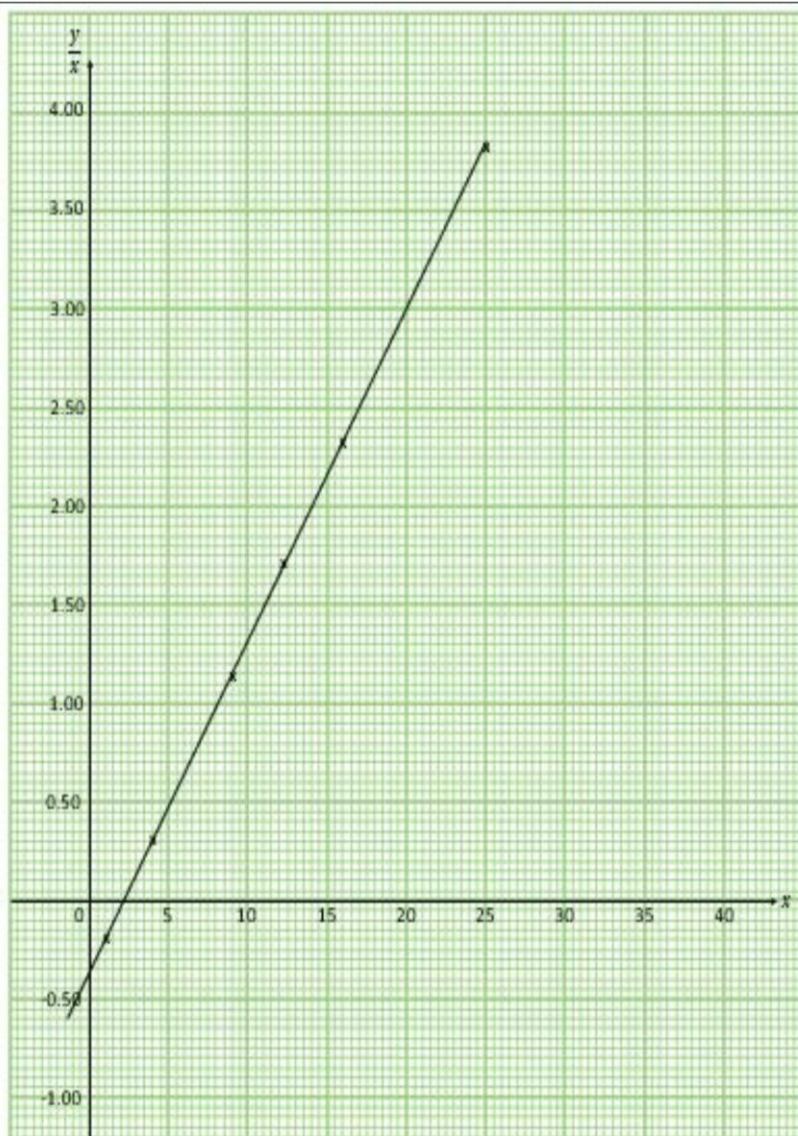
(a)	Rujuk muka surat 5	
(b)	$\frac{y}{x} = -\left(\frac{r}{p}\right)\left(\frac{1}{x^2}\right) + p$	P1
(i)	$p = 6$	N1
(ii)	$\frac{6 - (-2.9)}{0 - 9} = -\frac{r}{*6}$	K1
	$r = 5.93 \pm 0.05$	N1
(iii)	$y = 1$	N1
		10



SOALAN 9: SOALAN PERCUBAAN SPM NEGERI KELANTAN 2024 (KERTAS 1)

(a)	$P(1, 2)$	1
	$Q(3, 5)$	1
	NMA(No multiple answers)	
(b)	$\log_2 y = \frac{3}{2}x + c$ atau $\log_2 y = mx + \frac{1}{2}$	1
	$\log_2 y = \frac{3}{2}x + \frac{1}{2}$	1
	$y = 2^{\frac{3x+1}{2}}$	1
		5

SOALAN 10: SOALAN PERCUBAAN SPM NEGERI KELANTAN 2024 (KERTAS 2)



(c) (i) $\frac{y}{x} = \left(\frac{h+2}{6}\right)x - \frac{k}{6}$
 $\frac{h+2}{6} = 0.1658 *$
 $h = -1.0052$

1

1

1

(ii) $-\frac{k}{6} = -0.35$
 $k = 2.10$

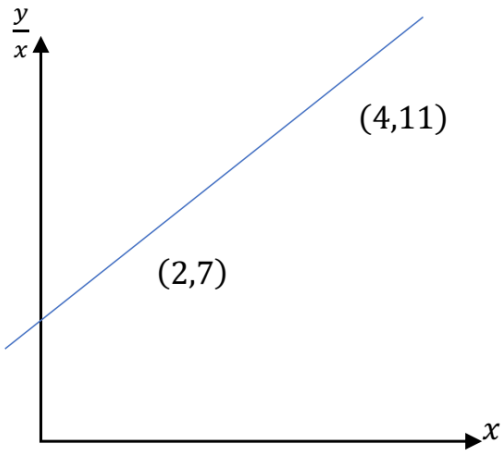
1

1

10

SOALAN 11: SOALAN PERCUBAAN SPM NEGERI PERLIS 2024 (KERTAS 1)

JAWAPAN:

(a)		Paksi dan garis lurus	1m	2
		(2,7) dan (4,11)	1m	
(b)	$k = \frac{11-7}{4-2} = 2$	1m		
	Ganti (2,7) ke dalam $\frac{y}{x} = 2x + h$	1m		
	$h = 3$	1m	3	

SOALAN 12: SOALAN PERCUBAAN SPM NEGERI PERLIS 2024 (KERTAS 2)

(a)

K	0.50	0.75	1.00	1.25	1.50	1.75
$\sqrt{p}$	0.65	2.24	3.81	5.25	6.80	8.30

1m

1m

2

(b)

Plot $\sqrt{p}$ melawan K
(paksi betul dan skala seragam)

1m

6 titik diplot dengan betul

1m

Garis lurus penyuaian terbaik

1m

3

(c)

$$\sqrt{p} = \frac{2}{\mu}K + \frac{2A}{\mu}$$

1m

$$* c = \frac{2A}{\mu}$$

1m

1m

$$* m = \frac{2}{\mu}$$

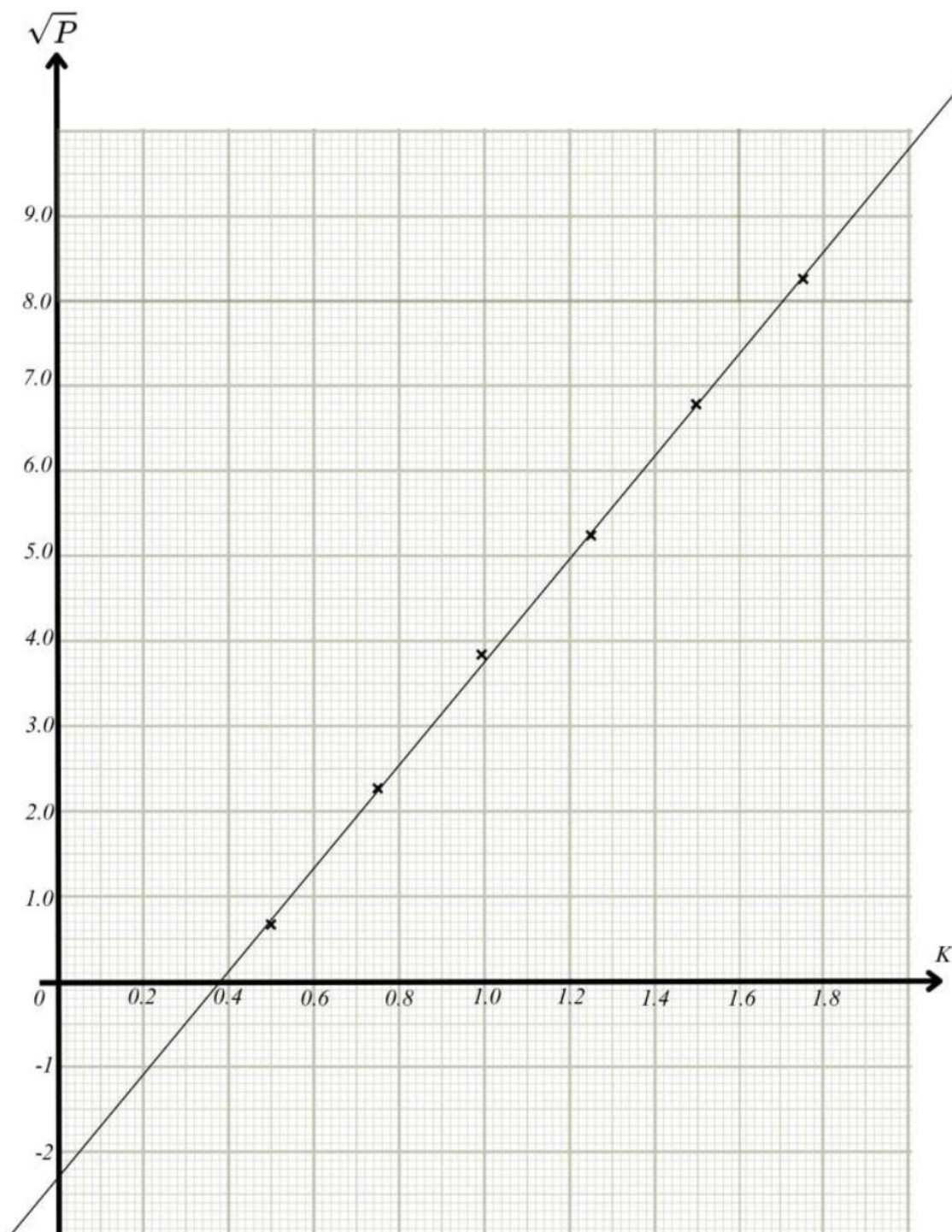
$$A = -0.3875$$

1m

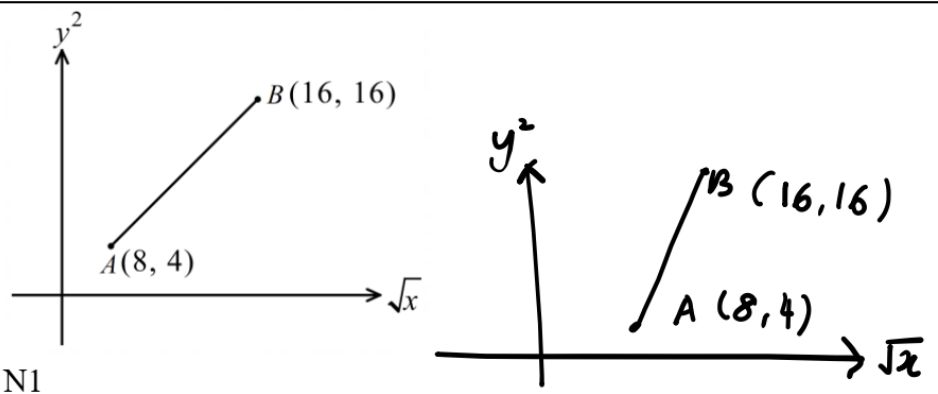
1m

$$\mu = 0.3298$$

5

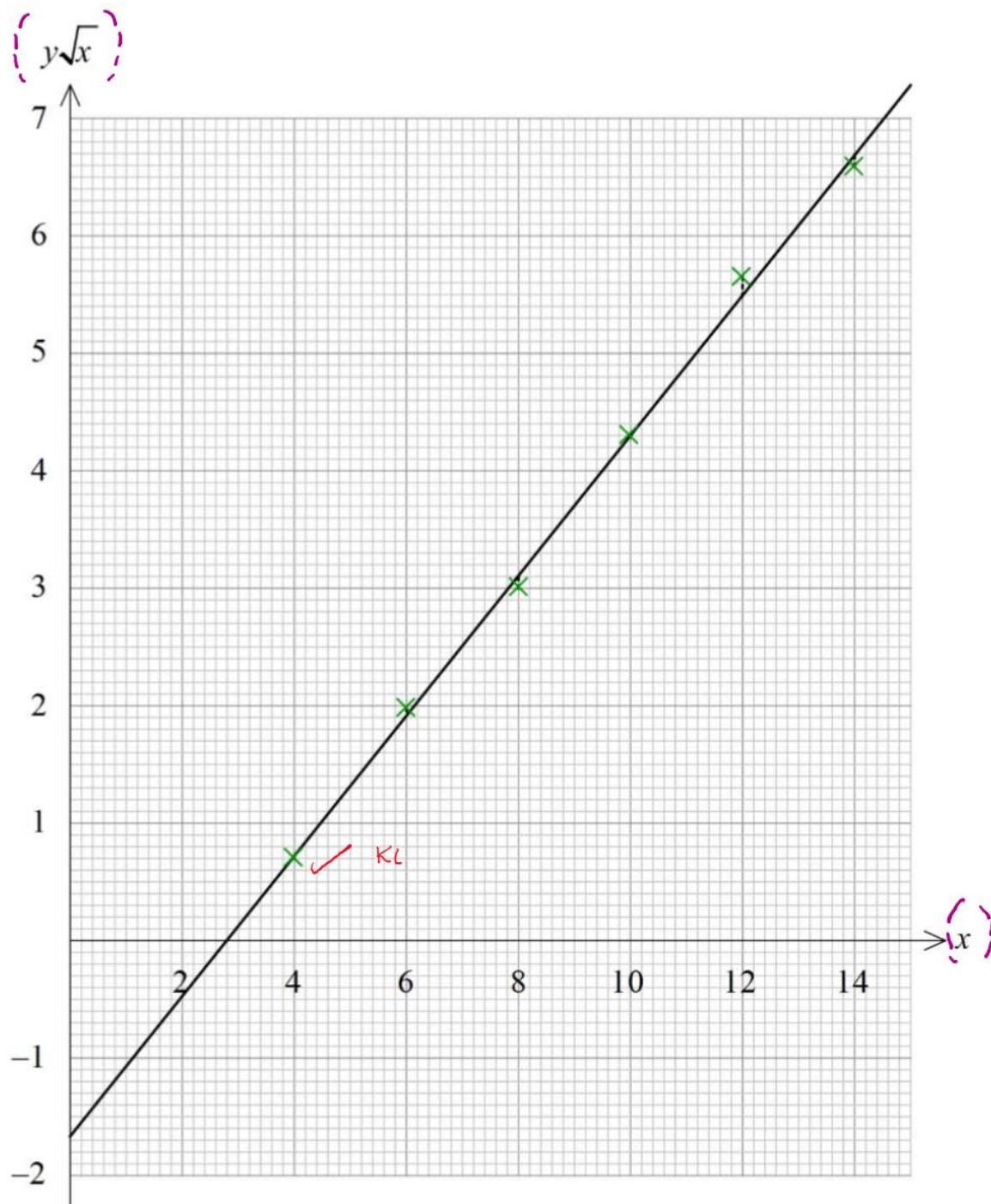


SOALAN 13: SOALAN PERCUBAAN SPM NEGERI KEDAH 2024 (KERTAS 1)

a)	 N1 • Garis lurus dan paksi dilukis menggunakan pembaris/alat tepi lurus. • Semua koordinat betul dan tajuk paksi betul. • Abaikan pintasan-Y	1
b)	$y^2 = p\sqrt{x} - 8$ P1 $p = \frac{16-4}{16-8}$ $p = \frac{3}{2} / 1.5$ K1 $y^2 = \frac{3}{2}\sqrt{x} - 8$ N1 [terima $Y = \frac{3}{2}X - 8$] [terima murid menjawab (b) dahulu kemudian (a)]	3

SOALAN 14: SOALAN PERCUBAAN SPM NEGERI KEDAH 2024 (KERTAS 2)

9(a)	<table border="1"> <tr> <td>$y\sqrt{x}$</td><td>0.70</td><td>1.98</td><td>3.00</td><td>4.30</td><td>5.65</td><td>6.59</td><td>N1</td></tr> </table>	$y\sqrt{x}$	0.70	1.98	3.00	4.30	5.65	6.59	N1	1	
$y\sqrt{x}$	0.70	1.98	3.00	4.30	5.65	6.59	N1				
9(b)	Graf garis lurus $y\sqrt{x}$ melawan x dilukis - Paksi-paksi betul dan skala seragam. - sekurang-kurangnya 1* titik diplot dengan betul. 6* titik diplot dengan betul Garis lurus penyuaian terbaik sekurang-kurangnya 2 titik diplotkan <i>dias gar / seimbang pada</i>	3									
9(c)(i)	$y\sqrt{x} = hx + \frac{1}{k}$ P1 Cari * $m = h$ K1 $h = \frac{3}{5} / 0.6$ N1 Cari * $c = \frac{1}{k}$ K1 $k = -0.5882$ N1 Syarat $-1.5 \leq c \leq -1.7$ $-1.7 \leq c \leq -1.5$	5									
9(c)(ii)	$y = 1.23$ N1	1	10								



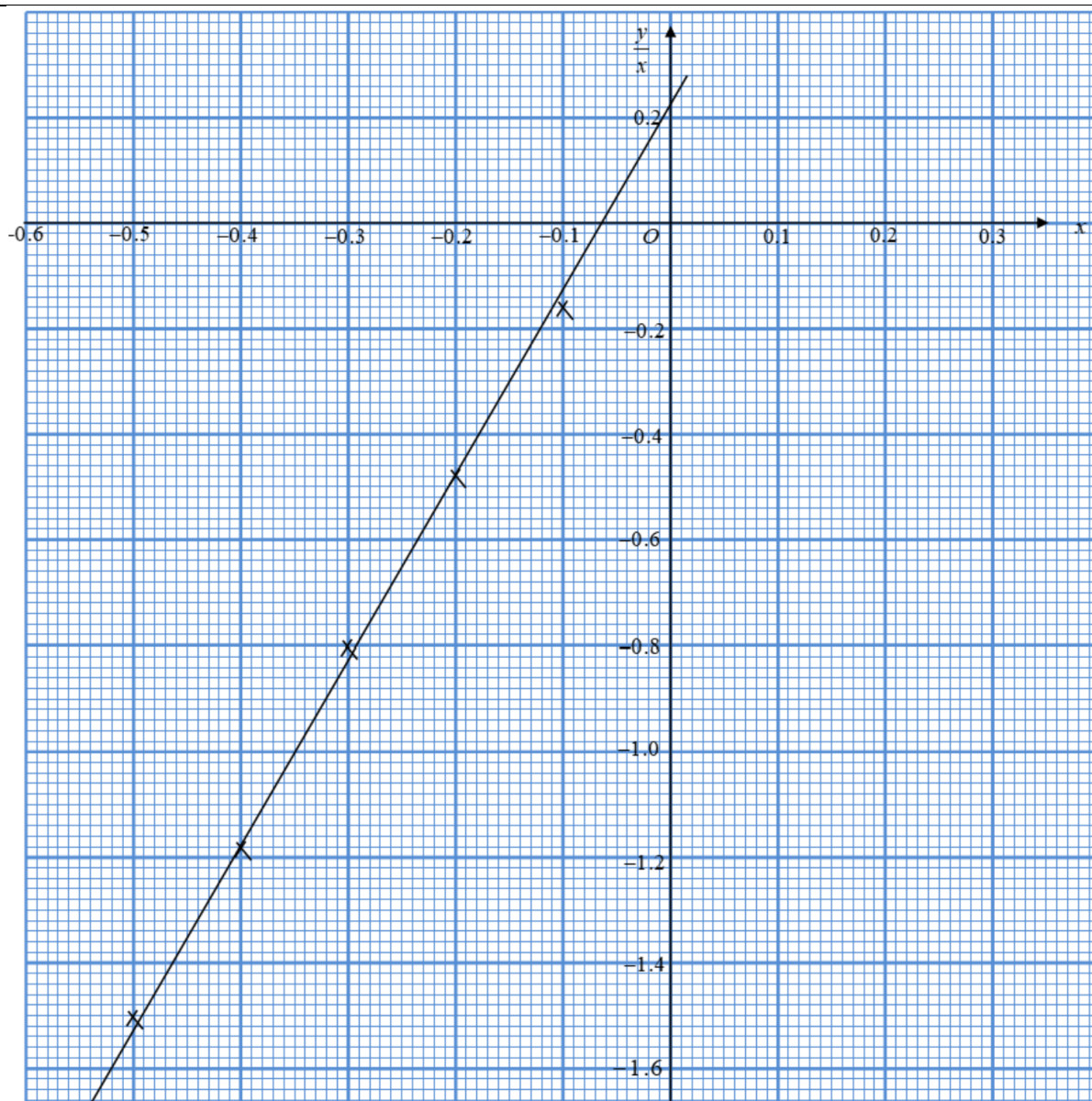
SOALAN 15: SOALAN PERCUBAAN SPM NEGERI PAHANG SET 1 2024 (KERTAS 1)

$\log_{10} y = (\log_{10} q)x + \log_{10} p$	K1
$\log_{10} p = 4$ DAN $\log_{10} q = -\frac{4}{(-3)} \text{ or } \log_{10} q = \frac{4-0}{0-(-3)}$	K1
$p = 10000$, $q = 21.54$	N1

SOALAN 16: SOALAN PERCUBAAN SPM NEGERI PAHANG SET 1 2024 (KERTAS 2)

JAWAPAN:

(a)		<table><tr><td>$\frac{y}{x}$</td><td>-1.88</td><td>-1.50</td><td>-1.18</td><td>-0.80</td><td>-0.48</td><td>-0.16</td></tr></table>	$\frac{y}{x}$	-1.88	-1.50	-1.18	-0.80	-0.48	-0.16	N1
$\frac{y}{x}$	-1.88	-1.50	-1.18	-0.80	-0.48	-0.16				
(b)		Rujuk Graf pada lampiran Paksi-paksi betul, skala seragam dan sekurang-kurangnya 1 titik diplot betul.	K1							
		Semua 6 titik diplot dengan betul.	N1							
		Garis lurus penyuaian terbaik dilukis [Sekurang-kurangnya 5 titik diplot]	N1							
(c)	(i)	0.7008	N1							
	(ii)	$\frac{y}{x} = px + (q - 1)$	P1							
		$p = *m$	K1							
		$p = 3.5$	N1							
		$q - 1 = 0.22$	K1							
		$q = 1.22$	N1							



MODUL TOPIKAL

SOALAN PERCUBAAN SPM

2024

TOPIK TINGKATAN 4
BAB 7

GEOMETRI KOORDINAT
(*COORDINATE GEOMETRY*)

SUMBER SOALAN:
SOALAN – SOALAN PERCUBAAN SPM NEGERI
TAHUN 2024

SKEMA JAWAPAN

DISUSUN OLEH:
PN. NOORUL HUDA BINTI MOHD HASHIM
(SMK TAMAN TASIK, TAIPING)
PN ZAINAB BINTI ABD RAHMAN
(SMK CONVENT, TAIPING)

SOALAN 1: SOALAN MODUL PINTAS SELANGOR SET 1 2024 (KERTAS 1)

a	$(x, y) = \left(\frac{2+6}{2}, \frac{5+(-1)}{2} \right)$ $\frac{1-2}{0-4}$ $y - 1 = \frac{1}{4}(x - 0)$ atau $y - 2 = \frac{1}{4}(x - 4)$ $y = \frac{1}{4}x + 1$ @ setara	P1	
		K1	
		K1	
		N1	
b	$\frac{1}{2} [(0)(-1) + (6)(5) + (2)(1)] - [(1)(6) + (-1)(2) + (5)(0)] $ 14	K1	
		N1	
c	$\sqrt{(x-0)^2 + (y-1)^2} = \sqrt{(x-6)^2 + (y-(-1))^2}$ $3x - y - 9 = 0$	K1	
		N1	
		8	

SOALAN 2: SOALAN MODUL PINTAS SELANGOR SET 1 2024 (KERTAS 2)

a	$\sqrt{(x - (-4))^2 + (y - 2)^2} = \sqrt{((-4) - (-1))^2 + (2 - (-1))^2}$ $x^2 + y^2 + 8x - 4y + 2 = 0$	P1	
		N1	2
b	$h = \frac{1(-4)+2(11)}{1+2}$ @ $-2 = \frac{1(2)+2k}{1+2}$ $h = 6$ @ $k = -4$ $h = 6$ dan $k = -4$	K1	
		N1	
		N1	3
c	$\frac{1}{2} [6(-1) + (-1)(3) + (t)(10)] - [10(-1) + (-1)(t) + 3(6)] = 30$ $7, -\frac{43}{11}$	K1	
		N1	2
d	$m = \frac{10-2}{6-(-4)}$ dan $\frac{4}{5} \times m_2 = -1$ $y - 2 = -\frac{5}{4}(x - 8)$ $y = -\frac{5}{4}x + 12$	K1	
		K1	
		N1	3
		10	

SOALAN 3: SOALAN MODUL PINTAS SELANGOR SET 2 2024 (KERTAS 1)

a	$(x, y) = \left(\frac{2+4}{2}, \frac{6+2}{2}\right)$	P1
	$\frac{1-4}{1-3}$	K1
	$y - 1 = \frac{3}{2}(x - 1) @ y - 4 = \frac{3}{2}(x - 3)$	K1
	$y = \frac{3}{2}x - \frac{1}{2} @ \text{ setara}$	N1
b	$\frac{1}{2} [(1)(2) + (4)(6) + (2)(1)] - [(4)(1) + (2)(2) + (1)(6)] $	K1
	7	N1
c	$\sqrt{(x-1)^2 + (y-1)^2} = \sqrt{(x-4)^2 + (y-2)^2}$	P1
	$3x + y - 9 = 0$	N1
		8

SOALAN 4: SOALAN MODUL PINTAS SELANGOR SET 2 2024 (KERTAS 2)

a	$\sqrt{(x - (-2))^2 + (y - 5)^2} = 4\sqrt{(x - 1)^2 + (y - (-1))^2}$	P1
	$5x^2 + 5y^2 - 12x + 14y + 1 = 0$	N1
b	$h = \frac{1(-2)+3(10)}{1+3} @ -1 = \frac{1(5)+3k}{1+3}$	K1
	$h = 7 @ k = -3$	N1
	$h = 7 \text{ dan } k = -3$	N1
c	$\frac{1}{2} [(3)(-1) + (1)(t) + (6)(9)] - [(9)(1) + (-1)(6) + (3)(t)] = 28$	K1
	-4, 52	N1
d	$m_1 = \frac{9-(-1)}{3-1} \text{ dan } 5 \times m_2 = -1$	K1
	$y - 2 = -\frac{1}{5}(x - 5)$	K1
	$y = -\frac{1}{5}x + 3$	N1
		10

SOALAN 5: SOALAN PERCUBAAN SPM NEGERI SABAH 2024 (KERTAS 1)

(a) Guna rumus jarak	K1	
$\sqrt{(h - (-4))^2 + (1 - (-1))^2}$		
$\sqrt{(h - (-4))^2 + (1 - (-1))^2} = 2\sqrt{10}$	K1	8
$h = 2$	N1	

SOALAN 6: SOALAN PERCUBAAN SPM NEGERI SABAH 2024 (KERTAS 2)

a) $\frac{1}{2} [(-3)(-2) + 6(0) + 0(4)] - [4(6) + (-2)(0) + 0(-3)]$	K1 N1	
b) $\frac{3(6) + 2(-3)}{3 + 2} \quad \text{or} \quad \frac{3(-2) + 2(4)}{3 + 2}$ $\left(\frac{12}{5}, \frac{2}{5} \right)$	K1 N1	7
c) $\sqrt{(x - (-3))^2 + (y - 4)^2} \quad \text{or} \quad \sqrt{(x - 6)^2 + (y - (-2))^2}$ $\sqrt{(x - (-3))^2 + (y - 4)^2} = 2\sqrt{(x - 6)^2 + (y - (-2))^2}$ $x^2 + y^2 - 18x + 8y + 45 = 0$	K1 K1 N1	

SOALAN 7: SOALAN PERCUBAAN SPM NEGERI SEMBILAN 2024 (KERTAS 1)

(a)	$\left(\frac{8-(-2)}{-4-6}\right)m_2 = -1$ atau setara	K1
	$\frac{y-8}{x-(-4)} = 1$ atau setara	K1
	$y = x + 12$	N1
(b)	$\frac{1}{2}[[8x + (-4)(-2) + 6y] - [(-4)y + (8)(6) + (-2)x]]$	K1
	$ 5x + 5y - 20 $	N1
(c)	$ 5x + 5(x + 12) - 20 = 60$	K1
	$10x + 40 = -60$	K1
	$A(-10, 2)$	N1
		8

SOALAN 8: SOALAN PERCUBAAN SPM NEGERI SEMBILAN 2024 (KERTAS 2)

(a)	$\frac{-10(1) + 22(3)}{1+3} = h$ atau $\frac{k(1) + 12(3)}{1+3} = 10$	K1
	$h = 14$, $k = 4$	N1N1
(b)	$m_1 = \frac{12-4}{22-(-10)}$ atau setara DAN $*m_1m_2 = -1$	K1
	$y - *4 = -4(x - (-10))$	K1
	$y = -4x - 36$	N1
(c)	$\sqrt{(x-22)^2 + (y-12)^2} = 13$	K1
	$x^2 + y^2 - 44x - 24y + 459 = 0$	N1
		8

SOALAN 9: SOALAN PERCUBAAN SPM NEGERI KELANTAN 2024 (KERTAS 1)

(a)		$\theta_2 = 90^\circ + \theta_1$	1	8
		$\tan \theta_2 = -\frac{1}{\tan \theta_1}$	1	
		$m_1 \times m_2 = -1$	1	
(b)	(i)	$\left(-\frac{3}{2}\right)m_2 = -1$	1	
		$y - 5 = \frac{2}{3}(x - 3)$	1	
		$y = \frac{2}{3}x + 3$	1	
	(ii)	$\frac{2}{3}x = -3$	1	
		$\left(-\frac{9}{2}, 0\right)$	1	

SOALAN 10: SOALAN PERCUBAAN SPM NEGERI KELANTAN 2024 (KERTAS 2)

(a)		$\sqrt{(x - (-3))^2 + (y - 2)^2}$ atau $\sqrt{(-6 - (-3))^2 + (-2 - 2)^2}$	1	7
		$\sqrt{(x - (-3))^2 + (y - 2)^2} = \sqrt{(-6 - (-3))^2 + (-2 - 2)^2}$	1	
		$x^2 + y^2 + 6x - 4y - 12 = 0$	1	
(b)		$\frac{2(-3) + 1(x)}{1 + 2} = -6$ atau $\frac{2(2) + 1(y)}{1 + 2} = -2$	1	
		$(-12, -10)$	1	
(c)		$\frac{1}{2} ((0)(2) + (-3)(-2) + (-6)(0)) - ((0)(-3) + (2)(-6) + (-2)(0)) $	1	
		9	1	

SOALAN 11: SOALAN PERCUBAAN SPM NEGERI PERLIS 2024 (KERTAS 1)

(a) $P(0,2)$ 1m 1

(b) Guna $\frac{1}{2} \times m_2 = -1$ 1m

$m_2 = -2$

Guna $\frac{y-y_1}{x-x_1} = m_2$ atau kaedah yang setara 1m

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

$y = -2x + 7$ 1m 3

(c) $\left(\frac{1x+4(0)}{1+4}, \frac{1y+4(3)}{1+4}\right) = (2,3)$

$\frac{1x+4(0)}{1+4} = 2$ atau $\frac{1y+4(3)}{1+4} = 3$ 1m

$R(10,3)$ 1m 2

SOALAN 12: SOALAN PERCUBAAN SPM NEGERI PERLIS 2024 (KERTAS 2)

(a)

Guna $\sqrt{(9-2)^2 + (4-3)^2}$

1m

$\sqrt{50}$ unit

1m

2

(b)

$\sqrt{(x-2)^2 + (y-3)^2} = \sqrt{50}$

1m

$x^2 + y^2 - 4x - 6y - 37 = 0$

1m

2

(c)

(i)

90° atau $\frac{3}{2}\pi$

1m

$\frac{1}{2}(\sqrt{50})^2 \left(\frac{3}{2}\pi\right)$

1m

$\frac{75}{2}\pi$ unit

1m

3

(ii)

$\frac{1}{2}(\sqrt{50})(\sqrt{50})$ atau $\frac{1}{2}\pi(5)^2$

1m

$\frac{75}{2}\pi - \left(\frac{25}{2}\pi - 25\right)$

1m

$25(\pi + 1)$ unit²

1m

3

SOALAN 13: SOALAN PERCUBAAN SPM NEGERI KEDAH 2024 (KERTAS 1)

$$M_{RS} = \frac{5-k}{6-h}$$

K1

$$M_{ST} = \frac{k-(-3)}{h-2}$$

K1

$$\left(\frac{5-k}{6-h}\right)\left(\frac{k-(-3)}{h-2}\right) = -1$$

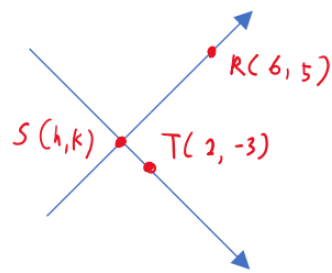
K1

$$\frac{5k+15-k^2-3k}{6h-12-h^2+2h} = -1$$

$$-k^2+2k+15 = -(-h^2+8h-12)$$

$$h^2+k^2-8h-2k-3=0$$

N1 [semua langkah betul]



4

SOALAN 14: SOALAN PERCUBAAN SPM NEGERI KEDAH 2024 (KERTAS 2)

7(a)

$m_{AC} = \frac{1 - (-2)}{-2 - 1}$ (-tersirat) @ $m_{BD} = \frac{2 - (-3)}{2 - (-3)}$

dan

$(m_{AC})(m_{BD}) = -1$

AC
~~AD~~ dan BD



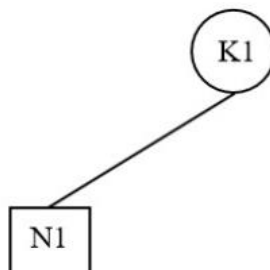
2

7(b)

Guna $\frac{1}{2} | (\quad) - (\quad) |$

$\frac{1}{2} | (-2(2) + 2(-2) + 1(-3) + (-3)(1)) - (2(1) + 1(2) + (-2)(-3) + (-2)(-3)) |$

15



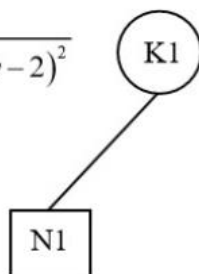
2

7(c)(i)

Guna rumus jarak

$2\sqrt{(x - (-2))^2 + (y - 1)^2}$
PA

@ $\sqrt{(x - 2)^2 + (y - 2)^2}$
PB



2

$3x^2 + 3y^2 + 20x - 4y + 12 = 0$

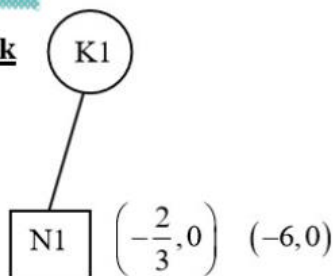
7(c)(ii)

Gantikan $y = 0$

$3x^2 + 3(0)^2 + 20x - 4(0) + 12 = 0$ dan

Selesaikan persamaan kuadratik

$3x^2 + 20x + 12 = 0$



2

SOALAN 15: SOALAN PERCUBAAN SPM NEGERI PAHANG SET 1 2024 (KERTAS 1)

(a)		$\frac{1}{2} \left ((-3)(2) + (5)(-6) + (-1)(h)) - ((h)(5) + (2)(-1) + (-6)(-3)) \right = 38$	K1
		4	N1
(b)		$M_{QR} = -\frac{1}{4}$ atau / or $y - 5 = -\frac{1}{4}(x - 3)$	K1
		$4y + x = 23$ atau setara / or equivalent	N1

SOALAN 16: SOALAN PERCUBAAN SPM NEGERI PAHANG SET 1 2024 (KERTAS 2)

(a)	(i)	$m = 2$	N1
		$n = 7$	N1
	(ii)	$-k = \frac{2(12) + 7(h)}{2 + 7}$ atau / or $-3h = \frac{2(12) + 7(3k)}{2 + 7}$	K1
		Selesaikan persamaan serentak	K1
		$h = 3, k = -5$	N1
(b)	(i)	$\sqrt{(x-3)^2 + (y-(-15))^2}$ atau $\sqrt{(3-5)^2 + (-15-(-9))^2}$	K1
		$\sqrt{(x-3)^2 + (y-(-15))^2} = \sqrt{(3-5)^2 + (-15-(-9))^2}$	K1
		$x^2 + y^2 - 6x + 30y + 198 = 0$	N1
	(ii)	$0^2 + y^2 - 6(0) + 30y + 198 = 0$	K1
		$b^2 - 4ac = -740, < 0$ dan TIDAK	N1

MODUL TOPIKAL

SOALAN PERCUBAAN SPM 2024

TOPIK TINGKATAN 4
BAB 8

VEKTOR
(*VECTORS*)

SUMBER SOALAN:
SOALAN – SOALAN PERCUBAAN SPM NEGERI
TAHUN 2024

SKEMA JAWAPAN

DISUSUN OLEH:
PN. NOORUL HUDA BINTI MOHD HASHIM
(SMK TAMAN TASIK, TAIPING)
PN ZAINAB BINTI ABD RAHMAN
(SMK CONVENT, TAIPING)

SOALAN 1: SOALAN MODUL PINTAS SELANGOR SET 1 2024 (KERTAS 1)

a	Kuantiti vektor kerana daya impuls mempunyai magnitud dan arah. <i>Vector quantity because the impulse force has magnitude and direction</i>		P1
b	(i)	Hukum Segitiga digunakan : <i>Triangle Law used :</i> $\overrightarrow{PT} = \overrightarrow{PO} + \overrightarrow{OT}$ atau $\overrightarrow{PS} = \overrightarrow{PO} + \overrightarrow{OS}$ atau setara $\frac{6}{5}k\hat{x} - \frac{3}{5}k\hat{y}$	P1 N1
	(ii)	$\overrightarrow{PS} = 8h\hat{x} + (h-1)\hat{y}$	N1
	(iii)	$8h = \frac{6}{5}k$ @ $h-1 = -\frac{3}{5}k$ $h-1 = -\frac{3}{5}\left(\frac{20}{3}h\right)$ $k = \frac{4}{3}$ dan $h = \frac{1}{5}$	K1 K1 N1
			7

SOALAN 2: SOALAN MODUL PINTAS SELANGOR SET 1 2024 (KERTAS 2)

a	$\frac{-5\hat{i} + 5\hat{j}}{\sqrt{(-5)^2 + 5^2}}$ $-\frac{1}{\sqrt{2}}\hat{i} + \frac{1}{\sqrt{2}}\hat{j}$		K1 N1	2
b	(i)	$\overrightarrow{BD} = \overrightarrow{BA} + \overrightarrow{AD}$ @ $\overrightarrow{EC} = \overrightarrow{ED} + \overrightarrow{DC}$ @ setara $\overrightarrow{BD} = -20\hat{x} + 32\hat{y}$	P1 N1	6
	(ii)	$\overrightarrow{EC} = 25\hat{x}$	N1	
	(iii)	$\overrightarrow{BD} = \lambda\overrightarrow{FD}$ $\overrightarrow{BD} = \frac{4}{3}(-15\hat{x} + 24\hat{y})$ @ $-20 = -15\lambda$ dan $32 = 24\lambda$ $\overrightarrow{BD} = \frac{4}{3}\overrightarrow{FD}$ @ $\overrightarrow{BD} = 4\overrightarrow{BF}$ @ setara dan B, F dan D segaris	P1 K1 N1	
				8

SOALAN 3: SOALAN MODUL PINTAS SELANGOR SET 2 2024 (KERTAS 1)

a	Kuantiti skalar kerana ketumpatan mempunyai nilai magnitud sahaja. <i>Scalar quantity because density only has magnitude value.</i>		P1
b	i	$\overrightarrow{AC} = \overrightarrow{AO} + \overrightarrow{OC}$	P1
		$\overrightarrow{OC} = 5\underset{\sim}{p} + 10\underset{\sim}{mq}$	N1
	ii	$\overrightarrow{OC} = \frac{3}{n}\underset{\sim}{p} + \frac{4}{n}\underset{\sim}{q}$	N1
	iii	$3 = 5n @ 4 = 10mn$	K1
$4 = 10m\left(\frac{3}{5}\right)$		K1	
$n = \frac{3}{5}$ dan $m = \frac{2}{3}$		N1	
			7

SOALAN 4: SOALAN MODUL PINTAS SELANGOR SET 2 2024 (KERTAS 2)

a	$\frac{4\vec{i}+4\vec{j}}{\sqrt{4^2+4^2}}$	K1
	$\frac{1}{\sqrt{2}}\vec{i} + \frac{1}{\sqrt{2}}\vec{j}$	N1
b	$\vec{QS} = \vec{QP} + \vec{PS} @ \vec{JR} = \vec{JS} + \vec{SR} @ \vec{QK} = \vec{QP} + \vec{PS}$ $@ \vec{KS} = \vec{KJ} + \vec{JS}$	P1
	i. $-20x + 32y$	N1
	ii. $25x$	N1
	iii. $\vec{QS} = \lambda\vec{QK}$	P1
	$-20 = -5\lambda \text{ dan } 32 = 8\lambda @ \vec{QS} = 4(-5x + 8y)$	K1
	$\vec{QS} = 4\vec{QK} @ \text{setara dan } K, Q \text{ dan } S \text{ adalah segaris.}$	N1
		8

SOALAN 5: SOALAN PERCUBAAN SPM NEGERI SABAH 2024 (KERTAS 1)

$$A = (-3, -6)$$

$$\sqrt{6^2 + 8^2} = \sqrt{(-3 + k)^2 + (-6)^2}$$

$$k = 11$$

$$\overrightarrow{AC} = 14\mathbf{i} + 2\mathbf{j}$$

P1

K1

N1

N1

4

SOALAN 6: SOALAN PERCUBAAN SPM NEGERI SABAH 2024 (KERTAS 2)

a)

$$\text{i) } \overrightarrow{PU} = \overrightarrow{PT} + \overrightarrow{TU} \text{ atau } \overrightarrow{QU} = \overrightarrow{QP} + \overrightarrow{PT} + \overrightarrow{TU}$$

$$2\mathbf{a} + 3\mathbf{b}$$

$$\text{ii) } \overrightarrow{QU} = \overrightarrow{QP} + \overrightarrow{PT} + \overrightarrow{TU}$$

$$2\mathbf{a} + \mathbf{b}$$

P1

N1

N1

10

b)

$$\overrightarrow{UR} = -\mathbf{a} - \mathbf{b}$$

$$\overrightarrow{UR} = m\overrightarrow{UP}$$

$$m_1 = \frac{1}{2} \quad m_2 = \frac{1}{3}$$

RPU tidak segaris kerana $\frac{1}{2} \neq \frac{1}{3}$.

N1

P1

N1

c)

$$\overrightarrow{QU} = 2\mathbf{a} + \mathbf{b}$$

$$= 2(-2\mathbf{i} - n\mathbf{j}) + n\mathbf{j}$$

$$= -4\mathbf{i} - 2n\mathbf{j} + n\mathbf{j}$$

$$= -4\mathbf{i} - n\mathbf{j}$$

$$\text{Unit Vektor } QU = \frac{-4\mathbf{i} - n\mathbf{j}}{\sqrt{(-4)^2 + (-n)^2}} = \frac{2}{\sqrt{m}}(-2\mathbf{i} + 2\mathbf{j})$$

$$\frac{-4\mathbf{i} - n\mathbf{j}}{\sqrt{(-4)^2 + (-n)^2}} = \frac{-4\mathbf{i} + 4\mathbf{j}}{\sqrt{m}}$$

Bandingkan:

$$-n = 4$$

$$n = -4$$

$$\sqrt{(-4)^2 + (4)^2} = \sqrt{m}$$

$$m = 16 + 16$$

$$m = 32$$

N1

K1

N1

N1

SOALAN 7: SOALAN PERCUBAAN SPM NEGERI SEMBILAN 2024 (KERTAS 1)

(a)	$\sqrt{\left(\frac{\sqrt{3}}{2}\right)^2 + \left(-\frac{1}{2}\right)^2}$ atau $\sqrt{(\sqrt{3})^2 + (-1)^2}$	K1
	Ya, sebab magnitud vektor = 1.	N1
(b)	$\begin{pmatrix} 3 \\ 8 \end{pmatrix} + \begin{pmatrix} p \\ q \end{pmatrix} = \begin{pmatrix} 8 \\ 4 \end{pmatrix}$	K1
	$\begin{pmatrix} p \\ q \end{pmatrix} = \begin{pmatrix} 5 \\ -4 \end{pmatrix}$ atau $3+p=8$ atau $8+q=4$	K1
	$p = 5$ dan $q = -4$	N1
		5

SOALAN 8: SOALAN PERCUBAAN SPM NEGERI SEMBILAN 2024 (KERTAS 2)

(a)	$\overline{AB} + \overline{BC}$ atau $\overline{BA} + \overline{AD}$	K1
(i)	$\overline{AC} = 2\underline{x} + 5\underline{y}$	N1
(ii)	$\overline{BD} = 3\underline{x} - 6\underline{y}$	N1
(b)	$\overline{BE} = \frac{4}{3}\underline{x} - \frac{8}{3}\underline{y}$	K1
	$*\left(\frac{4}{3}\underline{x} - \frac{8}{3}\underline{y}\right) = \lambda(3\underline{x} - 6\underline{y})$ atau setara	K1
	$3\lambda = \frac{4}{3}$ atau $-6\lambda = -\frac{8}{3}$	K1
	$\lambda = \frac{4}{9}$	K1
	$h = 4$ dan $k = 5$	N1
(c)	$9^2 + 12^2$ atau $[3(3)]^2 + [-6(2)]^2$	K1
	$15 = 15$. AB berserenjang dengan AD .	N1
		10

SOALAN 9: SOALAN PERCUBAAN SPM NEGERI KELANTAN 2024 (KERTAS 1)

(a)	$\begin{pmatrix} -6 \\ 12 \end{pmatrix} - 4 \begin{pmatrix} 2 \\ 3 \end{pmatrix}$	1	5
	$(-14, 0)$	1	
(b)	$\sqrt{(-8)^2 + (-12)^2}$	1	
	$4\sqrt{13}$	1	
(c)	$-\frac{2}{\sqrt{13}}i - \frac{3}{\sqrt{13}}j$ or $-\frac{2\sqrt{13}}{13}i - \frac{3\sqrt{13}}{13}j$	1	

SOALAN 10: SOALAN PERCUBAAN SPM NEGERI KELANTAN 2024 (KERTAS 2)

(a)	(i)	$\overrightarrow{PM} = \overrightarrow{PN} + \overrightarrow{NM}$ atau $\overrightarrow{OM} = \overrightarrow{ON} + \overrightarrow{NM}$	1	10
	(ii)	$\overrightarrow{PM} = 3\underline{x} - 6\underline{y}$	1	
		$\overrightarrow{OM} = 10\underline{x} - 4\underline{y}$	1	
(b)		$\sqrt{34^2 + (-8)^2}$	1	
		34.93	1	
(c)		$\overrightarrow{PT} = 3h\underline{x} - 6h\underline{y}$ atau $\overrightarrow{TS} = -5k\underline{x} - 4k\underline{y}$	1	
		$3h - 5k = -2$ atau $-6h - 4k = -4$	1	
		Selesaikan persamaan serentak	1	
		$k = \frac{4}{7}$	1	
		$h = \frac{2}{7}$	1	

SOALAN 11: SOALAN PERCUBAAN SPM NEGERI PERLIS 2024 (KERTAS 1)

(a) Guna $\overrightarrow{AC} = \overrightarrow{AO} + \overrightarrow{OC}$ atau $\overrightarrow{BC} = \overrightarrow{BO} + \overrightarrow{OC}$ (1m)

$$\overrightarrow{OC} = \begin{pmatrix} 2 \\ 4 \end{pmatrix} \quad \overrightarrow{OB} = \begin{pmatrix} 4 \\ -2 \end{pmatrix}$$

$C(2,4)$ dan $B(4,-2)$ (1m)

Guna $\left(\frac{2+4}{2}, \frac{4+(-2)}{2}\right)$ (1m)

$(3,1)$ (1m)

4

(b) Guna $|\overrightarrow{AC}| = \sqrt{6^2 + 3^2}$ (1m)

$$\widehat{AC} = \frac{6}{\sqrt{45}}i + \frac{3}{\sqrt{45}}j$$
 (1m)

2

SOALAN 12: SOALAN PERCUBAAN SPM NEGERI PERLIS 2024 (KERTAS 2)

(a) $\overrightarrow{PU} = \overrightarrow{PR} + \overrightarrow{RU}$ atau $\overrightarrow{PU} = \overrightarrow{PS} + \overrightarrow{SU}$ atau $\overrightarrow{PT} = \overrightarrow{PQ} + \overrightarrow{QT}$ (1m)

$$\overrightarrow{ST} = \frac{2}{3} \overrightarrow{SQ}$$
 (1m)

$$\overrightarrow{PU} = \frac{4}{3}\tilde{x} + \frac{2}{3}\tilde{y}$$
 (1m)

$$\overrightarrow{PT} = \frac{2}{3}\tilde{x} + \frac{1}{3}\tilde{y}$$
 (1m)

4

(b) Tulis $\overrightarrow{PU} = \lambda \overrightarrow{PT}$ (1m)

$$\overrightarrow{PU} = 2\left(\frac{4}{3}\tilde{x} + \frac{2}{3}\tilde{y}\right)$$
 (1m)

$$\overrightarrow{PU} = 2 \overrightarrow{PT}$$
 (1m)

3

SOALAN 13: SOALAN PERCUBAAN SPM NEGERI KEDAH 2024 (KERTAS 1)

6. (a) (i)	$\overrightarrow{AC} = \overrightarrow{AB} + \overrightarrow{BC}$ $= \begin{pmatrix} 12 \\ 0 \end{pmatrix} + \begin{pmatrix} -4 \\ -8 \end{pmatrix}$ $= \begin{pmatrix} 8 \\ -8 \end{pmatrix}$	P1 N1	2
6 a) (ii)	$ \overrightarrow{AC} = \sqrt{8^2 + (-8)^2} = 8\sqrt{2}$ $\overrightarrow{AC} = \frac{8i - 8j}{8\sqrt{2}} = \frac{i - j}{\sqrt{2}}$ $\overrightarrow{AC} = \begin{pmatrix} \frac{1}{\sqrt{2}} \\ -\frac{1}{\sqrt{2}} \end{pmatrix}$	K1 N1	2
6 b)	$\overrightarrow{EB} = \lambda \overrightarrow{BC}$ $\overrightarrow{EO} + \overrightarrow{OB} = \lambda \begin{pmatrix} -4 \\ -8 \end{pmatrix}$ $\begin{pmatrix} -k \\ -6 \end{pmatrix} + \begin{pmatrix} 6 \\ 2 \end{pmatrix} = \lambda \begin{pmatrix} -4 \\ -8 \end{pmatrix}$ $-4 = \lambda(-8)$ $\lambda = \frac{1}{2}$ $-k + 6 = \frac{1}{2}(-4)$ $k = 8$	K1 [$\overrightarrow{EB} = \lambda \overrightarrow{BC}$ mesti dilihat] N1 N1	3

SOALAN 14: SOALAN PERCUBAAN SPM NEGERI KEDAH 2024 (KERTAS 2)

Tuliskan hukum segitiga

$\triangle AOD @ \triangle AOE$

$$\vec{AD} = \vec{AO} + \vec{OD} @ \vec{OE} = \vec{OA} + \vec{AE}$$

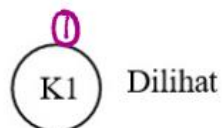
$$\vec{OE} = (1-m)\underline{a} + m\underline{d}$$



2

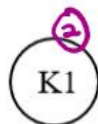
5(b)(i)

$$\vec{OE} = n(2\underline{a} + 3\underline{d})$$



Samakan $\vec{OE}$

$$n(2\underline{a} + 3\underline{d}) = (1-m)\underline{a} + m\underline{d}$$



Banding dan selesaikan $\underline{a}$ dan $\underline{d}$
 $3n = m$ dan $2n = 1 - m$

4

$$m = \frac{3}{5}, n = \frac{1}{5}$$

5(b)(ii)

2:3



1

SOALAN 15: SOALAN PERCUBAAN SPM NEGERI PAHANG SET 1 2024 (KERTAS 1)

(a)		$7\mathbf{i} + 14\mathbf{j}$	N1
(b)		$\sqrt{(7)^2 + (14)^2}$	K1
		$\frac{1}{\sqrt{245}}(7\mathbf{i} + 14\mathbf{j})$	N1

SOALAN 16: SOALAN PERCUBAAN SPM NEGERI PAHANG SET 1 2024 (KERTAS 2)

(a)	(i)	$\overrightarrow{XY} = \overrightarrow{XE} + \overrightarrow{EY}$ ATAU $\overrightarrow{DX} = \overrightarrow{DF} + \overrightarrow{FX}$ ATAU $\overrightarrow{GE} = \overrightarrow{GF} + \overrightarrow{FE}$ ATAU $\overrightarrow{YF} = \overrightarrow{YD} + \overrightarrow{DF}$	P1
		$-u$	N1
	(ii)	$2u + v$	N1
(b)		$\overrightarrow{YF} = u - v$	K1
		$\overrightarrow{FG} = \frac{4}{3}v - \frac{4}{3}u$	K1
		$\overrightarrow{GE} = \frac{4}{3}u + \frac{2}{3}v$	N1
		$\overrightarrow{DX} = \lambda \overrightarrow{GE}$ atau $\overrightarrow{GE} = \lambda \overrightarrow{DX}$	K1
		$\lambda = \frac{3}{2}$ atau $\lambda = \frac{2}{3}$	N1
		$\overrightarrow{DX} = \frac{3}{2}\overrightarrow{GE}$ // $\overrightarrow{GE} = \frac{2}{3}\overrightarrow{DX}$	K1
		$DX : GE = 3 : 2$	N1

MODUL TOPIKAL

SOALAN PERCUBAAN SPM

2024

TOPIK TINGKATAN 4
BAB 9

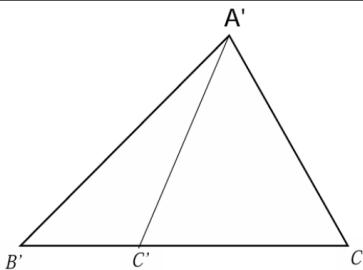
PENYELESAIAN SEGI TIGA
(*SOLUTION OF TRIANGLES*)

SUMBER SOALAN:
SOALAN – SOALAN PERCUBAAN SPM NEGERI
TAHUN 2024

SKEMA JAWAPAN

DISUSUN OLEH:
PN. NOORUL HUDA BINTI MOHD HASHIM
(SMK TAMAN TASIK, TAIPING)
PN ZAINAB BINTI ABD RAHMAN
(SMK CONVENT, TAIPING)

SOALAN 1: SOALAN MODUL PINTAS SELANGOR SET 1 (KERTAS 2)

a	(i)	$15^2 + 12^2 - 2(15)(12) \cos 80^\circ$ 17.51	K1 N1	5
	(ii)	55° dilihat $\frac{a}{\sin 45^\circ} = \frac{32}{\sin 55^\circ}$ 15.62	P1 K1 N1	
b		$\frac{1}{2} \times 15 \times 12 \times \sin 80^\circ$ $\frac{1}{2} \times 15 \times 12 \times \sin 80^\circ = 2 \left(\frac{1}{2} \times b \times b \times \sin 90^\circ \right)$ 9.414	K1 K1 N1	3
	c	 125°	N1 N1	
				10

SOALAN 2: SOALAN MODUL PINTAS SELANGOR SET 2 (KERTAS 2)

a	i	$5^2 + 9^2 - 2(5)(9) \cos 40^\circ$ 6.087	K1 N1
	ii	$\frac{\sin P}{9} = \frac{\sin 40^\circ}{7.8}$ 47.88°	K1 N1
	iii	$\angle PSR = 92.12^\circ$ (dilihat) $\frac{1}{2} \times 7.8 \times 9 \times \sin 92.12^\circ$ 35.08	P1 K1 N1
	b	Titik P kerana sisi PR bertentang dengan sudut terbesar. <i>Point P because side PR opposite to the largest angle.</i>	N1
c	$\sin 92.12^\circ = \frac{x}{7.8}$ @ $\frac{1}{2}(9)(x) = 35.08$ 7.795 // 7.796	K1 N1	
			10

SOALAN 3: SOALAN PERCUBAAN SPM NEGERI SABAH 2024 (KERTAS 2)

a)
 $AB^2 = 7.1^2 + 8^2 - 2(7.1)(8)\cos 50^\circ$

K1

$AB = 6.433$

N1

$\frac{\sin \angle BAC}{7.1} = \frac{\sin 50}{6.433}$

K1

$\angle BAC = 57.7$

N1

b)

$180^\circ - 57.7^\circ - 100^\circ = 22.3^\circ$

P1

$\frac{AD}{\sin 57.7^\circ} = \frac{8}{\sin 100^\circ}$

K1

$AD = 6.866$

$\frac{1}{2}(7.1)(8)\sin 50^\circ @ \frac{1}{2}(6.866)(8)\sin 22.3^\circ$

K1

$A_1 = 21.756, A_2 = 10.421$

$A_1 + A_2$

K1

$32.17 @ 32.18$

N1

c)
 $AB^2 = 7.1^2 + 8^2 - 2(7.1)(8)\cos 50^\circ$

K1

$AB = 6.433$

N1

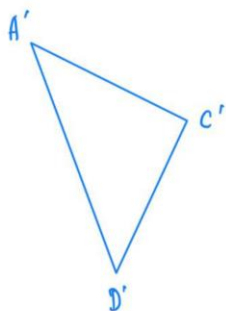
$\frac{\sin \angle BAC}{7.1} = \frac{\sin 50}{6.433}$

K1

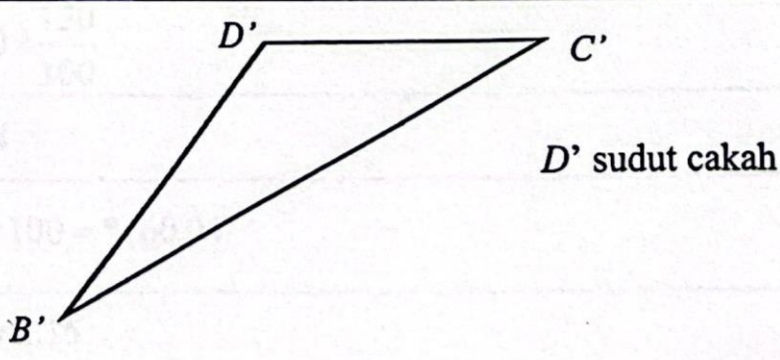
$\angle BAC = 57.7$

N1

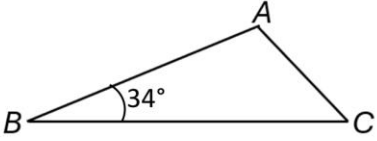
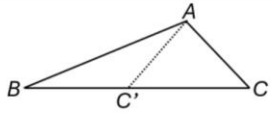
10



SOALAN 4: SOALAN PERCUBAAN SPM NEGERI SEMBILAN 2024 (KERTAS 2)

(a)(i)	$BD^2 = 12.8^2 + 5.6^2 - 2(12.8)(5.6) \cos 42^\circ$	K1
	9.416	N1
(ii)	$\frac{\sin \angle B}{3.9} = \frac{\sin 115^\circ}{*9.416}$	K1
	$\angle B = 22.05^\circ$	N1
(iii)	$\frac{1}{2}(12.8)(5.6) \sin 42^\circ$	K1
	23.98	N1
(iv)	$\frac{1}{2} \times 12.8 \times t = *23.98$	K1
	3.747	N1
(b)(i)		K1
(ii)	$\angle C'D'B' = 137.05^\circ$	N1
		10

SOALAN 5: SOALAN PERCUBAAN SPM NEGERI KELANTAN 2024 (KERTAS 2)

(a)			1	
(b)	(i)	$\frac{1}{2}(9)(BC)\sin 34^\circ = 28$	1	
		11.13	1	
	(ii)	$AC^2 = 9^2 + 11.13^2 - 2(9)(11.13)\cos 34^\circ$	1	
		6.228	1	
	(iii)	$\frac{\sin \angle ACB}{9} = \frac{\sin 34^\circ}{6.228}$	1	
		53.91°	1	
(c)		 $\angle BAC' = 19.91^\circ$	1	
		$\frac{1}{2}(9)(6.228)\sin 19.91^\circ$	1	
		9.544	1	10

SOALAN 6: SOALAN PERCUBAAN SPM NEGERI PERLIS 2024 (KERTAS 2)

(a)

$$\angle BAC = 67.38^\circ$$

1m

$$BC^2 = 0.2^2 + 0.3^2 - 2(0.2)(0.3) \cos 67.38^\circ$$

1m

$$0.2896 \text{ km}$$

1m

3

(b)

$$\frac{\sin BCA}{0.2} = \frac{\sin 67.38^\circ}{0.2896}$$

1m

$$39.61^\circ$$

1m

2

(c)

$$\text{Luas ADE}, \frac{1}{2} \times 0.13 \times 0.06 \times \sin 67.38^\circ$$

$$0.0036$$

1m

$$\text{Luas FGC}, \frac{1}{2} \times GF \times GC$$

$$\sin 39.61^\circ = \frac{GF}{FC} \quad \text{atau} \quad \cos 39.61^\circ = \frac{GC}{FC}$$

1m

$$GF = FC \times \sin 39.61^\circ \quad \text{atau} \quad GC = FC \times \cos 39.61^\circ$$

$$\frac{1}{2} [FC \times \sin 39.61^\circ \times FC \times \cos 39.61^\circ] = 0.0036$$

1m

$$FC = 0.12107$$

1m

$$0.09328 \text{ km}$$

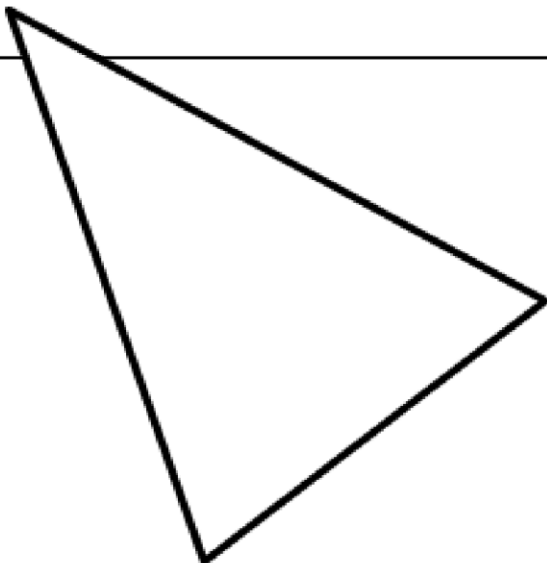
1m

5

SOALAN 7: SOALAN PERCUBAAN SPM NEGERI KEDAH 2024 (KERTAS 2)

12(a)(i)	Guna petua kosinus untuk mencari BC @ Guna petua sinus untuk mencari BC $BC^2 = 7^2 + 7^2 - 2(7)(7)\cos 50^\circ$ @ $\frac{BC}{\sin 50^\circ} = \frac{7}{\sin 65^\circ}$ 5.92	2
12(a)(ii)	Guna $s = \frac{a+b+c}{2}$ $s = \frac{7+7+5.92}{2}$ Guna rumus Heron $\sqrt{9.96*(9.96*7)(9.96*7)(9.96*5.92)}$ 18.78	3
12(b)	$\frac{1}{2}(8.14)(5.92*)\sin B = 20.98$ 119.40° (cakap)	2
12(c)	Nota: 1. $\angle A'C'B'$ adalah cakap. 2. Sisi-sisi dilakar dengan pembaris N1 NMA Guna petua sinus $\frac{\sin \angle B'C'A'}{8.14} = \frac{\sin 25^\circ}{5.92*}$ 144.45° ↔ 144.47°	3

SOALAN 8: SOALAN PERCUBAAN SPM NEGERI PAHANG SET 1 2024 (KERTAS 2)

(a)	(i)	$MO^2 = 7.2^2 + 5.4^2 - 2(7.2)(5.4)\cos 95.5^\circ$	K1
		9.405	N1
	(ii)	$\frac{\sin O}{7.2} = \frac{\sin 95.5^\circ}{9.405}$	K1
		49.64	N1
(b)	(i)	 $\angle M'N'O'$ mesti sudut tirus	N1
	(ii)	45.86	N1
	(iii)	$\frac{1}{2}(9.405)(7.2)\sin 45.86^\circ$	K1
		24.30	N1
		$24.30 = \frac{1}{2}(t) \left[\frac{(7.2)\sin 45.86^\circ}{\sin 49.64^\circ} \right] @\text{setara}$	K1
		7.167	N1

MODUL TOPIKAL

SOALAN PERCUBAAN SPM 2024

TOPIK TINGKATAN 5 **BAB 1**

SUKATAN MEMBULAT **(CIRCULAR MEASURE)**

SUMBER SOALAN:
SOALAN – SOALAN PERCUBAAN SPM NEGERI
TAHUN 2024

SKEMA JAWAPAN

Modul Pintas Selangor Set 1
Modul Pintas Selangor Set 2
Sabah
Negeri Sembilan
Kelantan
Pahang Set 1
Perlis
Kedah

DISUSUN OLEH:
PN. NOORUL HUDA BINTI MOHD HASHIM
(SMK TAMAN TASIK, TAIPING)

PN ZAINAB BINTI ABD RAHMAN
(SMK CONVENT, TAIPING)

SOALAN 1 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 1(KERTAS 1)

1	a	$\cos \theta = \frac{7}{12}$	K1	
		0.948 rad	N1	
	b	$s = 12 \times 0.948$	K1	
		11.38	N1	
			4	

SOALAN 2 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 1(KERTAS 1)

7	1.571 rad		P1
	$\frac{1}{2} \times 12^2 \times *1.571 @ \frac{1}{2} \times 12^2 \times \sin *90^\circ$		K1
	$8[(\frac{1}{2} \times 12^2 \times *1.571) - (\frac{1}{2} \times 12^2 \times \sin *90^\circ)] @ \text{ setara}$		K1
	228.40		N1
			4

SOALAN 3 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 2 (KERTAS 1)

1	a	$\frac{6.4}{8}$	K1
		0.8	N1
	b	$PR^2 = 8^2 + 8^2 - 2(8)(8) \cos 45.83^\circ @ \text{ setara}$	K1
		6.23	N1
			4

SOALAN 4 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 2 (KERTAS 1)

7	1.047 rad		P1
	$\frac{1}{2} \times 12^2 \times *1.047 @ \frac{1}{2} \times 12^2 \times \sin *60^\circ$		K1
	$3[(\frac{1}{2} \times 12^2 \times *1.047) - (\frac{1}{2} \times 12^2 \times \sin *60^\circ)] @ \text{ setara}$		K1
	39.09 (39.09 - 39.18) terima jawapan dalam julat ini		N1
			4

SOALAN 5: SOALAN PERCUBAAN SPM NEGERI SABAH (KERTAS 1)

7	(a) 2.095	N1	7
	(b) i)	K1	
	$7*(2.095) @ 7(3.142) @ \sqrt{7^2 + 7^2}$	K1	
	$7*(2.095) + 7(3.142) + 7(6) + * 7\sqrt{2}$	N1	
	88.56		
	ii)	K1	
	$\frac{1}{2}(7^2)*(2.095) @ \frac{1}{2}(7^2)(3.142) @ \frac{1}{2}(7)(7)$		
	$A_1 = 51.3275, A_2 = 76.979, A_3 = 24.50$		
	$*A_2 - *A_1 + *A_3$	K1	
	50.15	N1	

SOALAN 6: SOALAN PERCUBAAN SPM NEGERI SEMBILAN (KERTAS 2)

7	(a)	1.047 rad	N1
	(b)(i)	$6(0.5235)$ atau $3(1.571)$ atau $3 - (6 - \sqrt{27})$	K1
		$*BC + *DC + *BD$	K1
		10.05	N1
	(ii)	$A_1 = \frac{1}{2}(6)^2(0.5235)$ atau $A_2 = \frac{1}{2}(3)^2(1.571)$	K1
		$*A_2 - \left(*A_1 - \frac{1}{2}(\sqrt{27})(3)\right)$	K1
		5.441	N1
			7

SOALAN 7: SOALAN PERCUBAAN SPM KELANTAN (KERTAS 1)

6	$s = j(2\pi - \theta)$ or perimeter = $2j + j\theta$	1	4
	$\frac{j(2\pi - \theta)}{2j + j\theta} = \frac{3}{2}$	1	
	$1.3136 \text{ rad} \times \frac{180^\circ}{3.142}$	1	
	75.25°	1	

SOALAN 8: SOALAN PERCUBAAN SPM KELANTAN (KERTAS 2)

2	(a)	$PA = QA \text{ and } PB = QB$ $PAQB \text{ is a Rombus}$ $\angle APB = \angle AQB$ $2\theta + \theta = 2\pi$ (sudut di pusat adalah 2 kali sudut di lilitan) $\theta = \frac{2}{3}\pi$	1 1 1	
	(b)	Luas tembereng AQB $\frac{1}{2}j^2(\frac{2}{3}\pi) - \frac{1}{2}j^2 \sin(\frac{2}{3}\pi @ 120^\circ)$ $(\frac{\pi}{3} - \frac{\sqrt{3}}{4})j^2 \text{ cm}^2$ Luas rantau berlorek $\pi j^2 - 2(\frac{\pi}{3} - \frac{\sqrt{3}}{4})j^2$ $(\frac{1}{3}\pi + \frac{\sqrt{3}}{2})j^2 \text{ cm}^2$	1 1 1 1	7

SOALAN 9: SOALAN PERCUBAAN SPM PAHANG SET 1(KERTAS 1)

11	(a)	$\frac{1}{2}(x)^2 \left(\frac{40^\circ \times \pi}{180^\circ} \right)$	K1	
		$\frac{1}{9}\pi x^2$	N1	
	(b)	$\frac{1}{2}(x)(x) \sin 40^\circ$ ATAU $\frac{1}{2} \left(2x \sin \frac{40^\circ}{2} \right) \left(x \cos \frac{40^\circ}{2} \right)$	K1	
		$\frac{1}{9}\pi x^2 - 0.3214x^2 = 1.15$	K1	
		$x = 6.441$	N1	
				5

SOALAN 10: SOALAN PERCUBAAN SPM PAHANG SET 1 (KERTAS 2)

5	(a)		2.269	N1	
	(b)		$BD = 5$ atau $CD = 18.03$	P1	
			$10(2.269)$	K1	
			$10 + 10 + 10(2.269) + 5 + 18.03$	K1	
			65.72	N1	
					5

SOALAN 11: SOALAN PERCUBAAN SPM PERLIS (KERTAS 1)

5					
(a)	Guna $S = r\theta$	$\textcircled{1\text{m}}$			
	$1.1\theta = \frac{21}{27}$				
		0.7071 rad.	$\boxed{1\text{m}}$	2	
(b)					
	$21 = (1.1 + EA)0.7071$	$\textcircled{1\text{m}}$			
	$21 + \frac{21}{27} + 2(29.70 - 1.1)$	$\textcircled{1\text{m}}$			
		78.98 cm	$\boxed{1\text{m}}$	3	
					5

SOALAN 12: SOALAN PERCUBAAN SPM PERLIS (KERTAS 2)

3

(a)

$$BB' = 42 \times \left(150^\circ \times \frac{\pi}{180^\circ}\right) \quad (1\text{m})$$

$$BB' = 109.97\text{cm} \quad (1\text{m})$$

2

(b)

$$AA' = 7 \times \left(150^\circ \times \frac{\pi}{180^\circ}\right) \quad (1\text{m})$$

$$\frac{AA'}{BB'} = \frac{7 \times \left(150^\circ \times \frac{\pi}{180^\circ}\right)}{42 \times \left(150^\circ \times \frac{\pi}{180^\circ}\right)}$$

$$= \frac{7}{42}$$

$$\frac{1}{6}$$

$$1:6 \quad (1\text{m})$$

3

(c)

$$\left[\frac{1}{2} \times 42^2 \times 2.618\right] - \left[\frac{1}{2} \times 7^2 \times 2.618\right] \quad (1\text{m})$$

$$2244.94\text{ cm}^2 \quad (1\text{m})$$

2

7

SOALAN 13: SOALAN PERCUBAAN SPM KEDAH (KERTAS 1)

5 a)	Panjang lengkok AC = $100 - 30 - 30 = 40$ Sudut minor AOC: $40 = 30 \times \theta$ K1 $\theta = 1.333 \text{ rad} @ \frac{4}{3} \text{ rad} @ 1\frac{1}{3} \text{ rad}$ N1	2	4
5 b)	Luas sektor OAC = $\frac{1}{2} \times 30^2 \times 1.333$ = 599.85 m^2 atau Luas sektor OPR = $\frac{1}{2} \times 40^2 \times 1.333$ K1 = 1066.4 m^2 Luas kawasan berlorek = $1066.40 - 599.85$ $466.55 \leftrightarrow 466.67$ @ N1 $\frac{1400}{3}$	2	

SOALAN 14: SOALAN PERCUBAAN SPM KEDAH (KERTAS 2)

No.	SKEMA PEMARKAHAN	Sub Markah	Jumlah Markah
3(a)	<u>Mencari luas sektor @ luas segitiga</u> Luas sektor, $L_{OJK} = \frac{1}{2}(4)^2 \left(\beta \times \frac{\pi}{180^\circ} \right)$ ATAU P1 Luas segitiga, $L_{\Delta OJK} = \frac{1}{2}(4)^2 (\sin \beta)$ <u>Luas bulatan</u> ATAU <u>Luas tembereng minor *</u> $\pi(4^2)$ $8 \left(\frac{\beta\pi}{180^\circ} - \sin \beta \right)$ K1 ⁰ K1 ² <u>Luas bulatan -luas tembereng minor*</u> $\pi(4^2) - 8 \left(\beta \times \frac{\pi}{180^\circ} - \sin \beta \right)^*$ $16\pi - 8 \left(\frac{\pi\beta}{180^\circ} - \sin \beta \right)$ N1	4	
3(b)	<u>Mencari panjang AB@EF dan $\angle AOB$ @ $\angle EOF$</u> $4\sqrt{3}$ cm dan $\frac{\pi}{3}$ rad / 60° ATAU N1 <u>Panjang lengkok DE @ AC (guna rumus $s = r\theta$)</u> $4 \left(\frac{\pi}{3} \right)$ <u>Hasil tambah AB+BC+panjang lengkok AC*+EF+FD</u> <u>+panjang lengkok DE*</u> $4\sqrt{3} + 4 + \frac{4\pi}{3} + 4\sqrt{3} + 4 + \frac{4\pi}{3} @ 2 \left(4\sqrt{3} + 4 + \frac{4\pi}{3} \right)$ K1 $21.86 + \frac{8}{3}\pi / 8 + 8\sqrt{3} + \frac{8}{3}\pi / 8 \left(\sqrt{3} + \frac{\pi}{3} + 1 \right)$ N1	3	
			7

MODUL TOPIKAL

SOALAN PERCUBAAN SPM 2024

TOPIK TINGKATAN 5 **BAB 2**

DIFFERENTIATION **(PEMBEZAAN)**

SUMBER SOALAN:
SOALAN – SOALAN PERCUBAAN SPM NEGERI
TAHUN 2024

SKEMA JAWAPAN

Modul Pintas Selangor Set 1
Modul Pintas Selangor Set 2
Sabah
Negeri Sembilan
Kelantan
Pahang Set 1
Perlis
Kedah

DISUSUN OLEH:
PN. NOORUL HUDA BINTI MOHD HASHIM
(SMK TAMAN TASIK, TAIPING)

PN ZAINAB BINTI ABD RAHMAN
(SMK CONVENT, TAIPING)

SOALAN 1 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 1(KERTAS 1)

6	a	$\frac{dy}{dx} = 5 - 2x$ @ $\frac{d^2y}{dx^2} = -2$	K1
		$(5x - x^2)(-2) + (5 - 2x)^2 + 15$	K1
		$6x^2 - 30x + 40$	N1
	b	$\frac{dL}{dx} = 2x$ @ $\frac{dL}{dt} = \frac{1}{2(3)} \times 3$	K1
		$\frac{1}{2}$	N1
			5

SOALAN 2 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 1(KERTAS 1)

11	a	$m - \frac{27}{m^2} = 0$	K1
		3	N1
	b	$1 + \frac{54}{x^3}$	K1
		$1 + \frac{54}{3^3} > 0$	K1
		(3, 3) ialah titik minimum	N1
			5

SOALAN 3 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 1 (KERTAS 2)

8	a	$(2x + 6)^6(3) + 3x[12(2x + 6)^5]$ $6(2x + 6)^5(7x + 3)$	K1 N1	2
	b	$\delta y = 5(x + \delta x)^2 - 5x^2$ @ $\delta y = 10x + 5(\delta x)$	K1	3
		$\frac{dy}{dx} = \lim_{\delta x \rightarrow 0} 10x + 5(\delta x)$ dan $10x + 5(0)$	K1	
		10x	N1	
	c	$\frac{2(x - 2) - 1(2x - 8)}{(x - 2)^2}$	K1	5
		$3h = \frac{4}{(x - 2)^2}$	K1	
		$h = \frac{1}{12}$	N1	
		$m_2\left(\frac{1}{4}\right) = -1$	K1	
		$m_2 = -4$	N1	

SOALAN 4 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 2 (KERTAS 1)

4	a	$\frac{dA}{dr} = 2\pi r$ @ $\frac{dA}{dt} = 2\pi(2) \times 3$ 12π	K1 N1	
	b	$k'(x) = 3mx^2 - 4x + 6$ @ $k''(x) = 6mx - 4$ $6m(2) - 4 = 3m(1)^2 - 4(1) + 6$ $m = \frac{2}{3}$	K1 K1 N1	
			5	

SOALAN 5: SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 2 (KERTAS 1)

11		$\frac{x[2(x-5)] - 1(x-5)^2}{x^2}$ @ $1 - \frac{25}{x^2}$	K1	
		$\frac{x^2 - 25}{x^2} = 0$ @ $1 - \frac{25}{x^2} = 0$	K1	
		$(5,0), (-5, -20)$	N1	
		$\frac{x^2(2x) - 2x(x^2 - 25)}{(x^2)^2}$ @ $\frac{50}{x^3}$	K1	
		$x = 5, \frac{d^2y}{(dx)^2} = \frac{2}{5} > 0$, $(5,0)$ ialah titik minimum dan $x = -5, \frac{d^2y}{(dx)^2} = -\frac{2}{5} < 0$, $(-5, -20)$ ialah titik maksimum	N1	
			5	

SOALAN 6: SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 2 (KERTAS 2)

8	a	$\frac{(2x+x^3)(0)-11(2+3x^2)}{(2x+x^3)^2} @ -11(2x+x^3)^{-2}(2+3x^2)$ $-\frac{11(2+3x^2)}{(2x+x^3)^2}$	K1	
			N1	
	b	$\delta y = 4(x + \delta x)^2 - 4x^2$ $\frac{dy}{dx} = \lim_{\delta x \rightarrow 0} (8x + 4(\delta x)) \quad \text{dan} \quad 8x + 4(0)$ $8x$	K1	
			K1	
			N1	
	c	i	$2(x-2)(x) + 1(x-2)^2$	K1
			$y-1 = -1(x-1)$ $y = -x + 2$	K1
				N1
		ii	$-1 \times 1 = -1,$ normal	K1
				N1
				10

SOALAN 7: SOALAN PERCUBAAN SPM SABAH (KERTAS 1)

4	(a)	$2(x + \delta x)^2 - 3(x + \delta x)$	P1	6
		$\text{had} * \frac{[2(x + \delta x)^2 - 3(x + \delta x)] - (2x^2 - 3x)}{\delta x}$	K1	
		$\frac{dy}{dx} = 4x - 3$ Nota: δx boleh diganti denga apa-apa pembolehubah kecuali x dan y .	N1	
	(b)	Kamir $\frac{x^4 - 8x^2}{3x}$ terhadap x	K1	
		$\left(y = \frac{1}{12}x^4 - \frac{4}{3}x^2 + c \right)$		
		Ganti (2, -1) ke dalam *kamiran DAN Selesaikan untuk c	K1	
		$-1 = \frac{1}{12}(2)^4 - \frac{4}{3}(2)^2 + c$ $c = 3$ $y = \frac{1}{12}x^4 - \frac{4}{3}x^2 + 3$	N1	

SOALAN 8: SOALAN PERCUBAAN SPM SABAH (KERTAS 2)

7	a)	P1	10	
	$\frac{x}{1.5x} = \frac{r}{h}$	N1		
	$V = \frac{4\pi}{27}h^3$			
	Nota: mesti lihat ada guna rumus isi padu kon			
	b)	K1		
	Beza V terhadap h			
	$\frac{dV}{dh} = 36\pi$	K1		
	$*36\pi \times (8.97 - 9)$	K1		
	$\delta V = -1.08\pi$			
	$\frac{* -1.08\pi}{\frac{4\pi}{27}(9)^3} \times 100$	K1		
	Menurun 1%	N1		
	c)	K1		
	Beza A terhadap h dan ganti $h = 9$ ke dalam $\frac{dA}{dh}$			
	8π	K1		
	$-25\pi = *8\pi \times \frac{dh}{dt}$	K1		
	$\frac{dh}{dt} = -\frac{25}{8}$			
	$*36\pi \times * \left(-\frac{25}{8}\right)$	K1		
	-112.5π	N1		

SOALAN 9: SOALAN PERCUBAAN SPM NEGERI SEMBILAN (KERTAS 1)

7	(a)	$\frac{dy}{dx} = 3px^2 + 2qx$	K1
		$3p(1)^2 + 2q(1) = 5$	K1
		$q = \frac{5-3p}{2}$	N1
	(b)	$\frac{dy}{du} = -\frac{5}{2}u^{-6}$ atau $\frac{du}{dx} = -3$	K1
		$\frac{dy}{dx} = -\frac{5}{2}u^{-6} \times -3$	K1
		$\frac{dy}{dx} = \frac{15}{2(6-3x)^6}$	N1
			6

SOALAN 10: SOALAN PERCUBAAN SPM NEGERI SEMBILAN (KERTAS 2)

6	(a)	$\delta x = 0.06$ atau $\frac{dA}{dx} = 4x - \frac{540}{x^2}$	K1
		$\delta A = \left[4(3) - \frac{540}{(3)^2} \right] \times 0.06$	K1
		$\delta A = -2.88$	N1
		$\frac{2.88}{198} \times 100$	K1
		1.455 %	N1
	(b)	$4x - \frac{540}{x^2} = 0$	K1
		5.1299 atau 5.130	N1
			7

SOALAN 11: SOALAN PERCUBAAN SPM KELANTAN (KERTAS 1)

15	(a)	(i)	$\frac{\delta y}{\delta x} = \frac{3(x + \delta x)^2 + 1 - (3x^2 + 1)}{\delta x}$	1	8
			$\frac{dy}{dx} = \lim_{\delta x \rightarrow 0} (6x + 3\delta x)$	1	
			$\frac{dy}{dx} = 6x$	1	
		(ii)	$\frac{dy}{dx} = x - 3$	1	
	(b)		$\frac{dV}{dr} = 4\pi r^2$ atau $\frac{dV}{dt} = -2.5\pi$	1	
			$4\pi(5)^2$	1	
			$\frac{dr}{dt} = \frac{1}{100\pi} \times -2.5\pi$	1	
			-0.025	1	

SOALAN 12: SOALAN PERCUBAAN SPM KELANTAN (KERTAS 2)

6	(a)		$2x + 2r + \pi r = 80$	1	7
			$2r \left(\frac{80 - 2r - \pi r}{2} \right)$	1	
			$A = 80r - 2r^2 - \frac{1}{2}\pi r^2$	1	
	(b)		$\frac{dA}{dr} = 80 - 4r - \pi r$ dan samakan dengan 0	1	
			$r = 11.20$	1	
			$A = 80(11.20) - 2(11.20)^2 - \frac{1}{2}\pi(11.20)^2$	1	
			448.05	1	

SOALAN 13: SOALAN PERCUBAAN SPM PAHANG SET 1 (KERTAS 1)

8	(a)		$\lim_{\delta x \rightarrow 0} \frac{2}{3}x + \frac{1}{3}\delta x$	K1	
			$\frac{dy}{dx} = \frac{2}{3}x$	N1	
	(b)	(i)	$\frac{dy}{dx} = \frac{(x+1)[1] - x[1]}{(x+1)^2}$	K1	
			$\frac{1}{(q+1)^2}$	N1	
		(ii)	$-p \times m_T = -1 \quad \text{DAN} \quad \frac{1}{(q+1)^2} = \frac{1}{p}$	K1	
			$q = \pm\sqrt{p} - 1$	N1	
					6

SOALAN 14: SOALAN PERCUBAAN SPM PERLIS (KERTAS 1)

No.	Peraturan Pemarkahan	Markah	Jumlah markah
1			
(a)	Guna $\frac{dx}{dt} = \frac{dx}{dp} \times \frac{dp}{dt}$ (1m) $\frac{1}{2} \times 3$ $\frac{3}{2}$ (1m)	2	
(b)	Guna $\frac{dy}{dx} = \frac{dy}{dp} \times \frac{dp}{dx}$ (1m) $\frac{6}{p^3} \times 2$ $\frac{dy}{dx} = \frac{12}{(2x-3)^3}$ (1m)	2	
(c)	Guna $\frac{\delta y}{\delta x} \approx \frac{dy}{dx}$ dan ganti $x = 2$ (1m) $\frac{12}{(2x-3)^3} \times (-0.02)$ $\delta y = \frac{12}{(2(2)-3)^3} \times (-0.02)$ -0.24 (1m)	2	6

SOALAN 15: SOALAN PERCUBAAN SPM PERLIS (KERTAS 1)

14 (a) (b)	$\frac{dx}{dh} = 1 + \frac{1}{h^2} = \frac{h^2+1}{h^2}$ (1m) $\frac{dy}{dh} = 2 - \frac{1}{h^2} = \frac{2h^2-1}{h^2}$ (1m) Guna $\frac{dy}{dx} = \frac{dy}{dh} \times \frac{dh}{dx}$ (1m) $\frac{2h^2-1}{h^2} \times \frac{h^2}{h^2+1}$ $\frac{2h^2-1}{h^2+1}$ (1m) Guna $\frac{dy}{dx} = 0$ (1m) $\frac{2h^2-1}{h^2+1} = 0$ $h = \frac{1}{2}$ (1m) Ganti $h = \frac{1}{2}$ ke dalam $x = h - \frac{1}{h}$ dan $y = 2h + \frac{1}{h}$ (1m) $(-\frac{3}{2}, 3)$ (1m)	4 4	8	
---------------------------------	---	-------------------	----------	--

SOALAN 16: SOALAN PERCUBAAN SPM KEDAH (KERTAS 1)

NO	PENYELESAIAN	MARKAH
9. (a)	$\lim_{x \rightarrow 0^-} f(x) = -1$ $\lim_{x \rightarrow 0^-} f(x) = 1$ $\lim_{x \rightarrow 0^-} f(x) \neq \lim_{x \rightarrow 0^+} f(x),$ $\therefore \lim_{x \rightarrow 0} f(x)$ tidak wujud N1 had dari arah kiri tidak sama dengan had dari arah kanan N1	2
9 b)	$y = \frac{2}{x+4}$ $\delta y = f(x + \delta x) - f(x)$ $= \frac{2}{(x + \delta x) + 4} - \frac{2}{x + 4}$ K1 $= \frac{2(x + 4) - 2(x + \delta x + 4)}{(x + \delta x + 4)(x + 4)}$ $= \frac{-2\delta x}{(x + \delta x + 4)(x + 4)}$ $\frac{\delta y}{\delta x} = \frac{-2}{(x + \delta x + 4)(x + 4)}$ K1 $\frac{dy}{dx} = \lim_{\delta x \rightarrow 0} \frac{\delta y}{\delta x}$ $= \lim_{\delta x \rightarrow 0} \frac{-2}{(x + \delta x + 4)(x + 4)}$ K1 [had dilihat dan gantikan $\delta x = 0$] $= \frac{-2}{(x + 0 + 4)(x + 4)}$ $= \frac{-2}{(x + 4)(x + 4)}$ $= -\frac{2}{(x + 4)^2}$ N1	4
	JUMLAH	6

SOALAN 17: SOALAN PERCUBAAN SPM KEDAH (KERTAS 2)

4(a)

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

$\frac{dy}{dx} = \frac{9}{2}x - 4x$

Mesti betul sekurang-kurangnya
satu sebutan dengan
kuasa x berkurang satu

$\frac{dy}{dx} = \frac{9}{2}(1)^2 - 4(1)$

Gantikan $x = 1$ dalam $\frac{dy}{dx}$

$\frac{dy}{dx} = \frac{1}{2}$

K1

K1

K1

Guna $y - 2 = \frac{1}{2}(x - 1)$

$2 = \frac{1}{2}(1) + c$

Selesaikan untuk c

$c = \frac{3}{2}$

$y = \frac{1}{2}x + \frac{3}{2}$ @sctara

N1

4

4(b)

Guna $\left(\frac{1}{2}\right)(m_N) = -1$

$m_N = -2$

Bandingkan pintasan-y

$q^2 + 3 = 4$

@Gantikan (1,2) dalam persamaan

P1

K1

N1 $q = 1$

3

~~$21.86 + \frac{8}{3}\pi/8 + 8\sqrt{3} + \frac{8}{3}\pi/8\left(\sqrt{3} + \frac{\pi}{3} + 1\right)$~~

7

MODUL TOPIKAL
SOALAN PERCUBAAN SPM 2024

TOPIK TINGKATAN 5
BAB 3

INTEGRATION
(PENGAMIRAN)

SUMBER SOALAN:
SOALAN – SOALAN PERCUBAAN SPM NEGERI
TAHUN 2024

SKEMA JAWAPAN

Modul Pintas Selangor Set 1
Modul Pintas Selangor Set 2
Sabah
Negeri Sembilan
Kelantan
Pahang Set 1
Perlis
Kedah

DISUSUN OLEH:
PN. NOORUL HUDA BINTI MOHD HASHIM
(SMK TAMAN TASIK, TAIPING)

PN ZAINAB BINTI ABD RAHMAN
(SMK CONVENT, TAIPING)

SOALAN 1 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 1(KERTAS 1)

10	$3 \left[\frac{2x}{1-3x} - 5 \right]_{-2}^1$	P1	
	$3 \left[\left(\frac{2(1)}{1-3(1)} - 5 \right) - \left(\frac{2(-2)}{1-3(-2)} - 5 \right) \right]$	K1	
	$-\frac{9}{7}$	N1	
		3	

SOALAN 2 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 1(KERTAS 2)

6	a	$y = \frac{x^3}{3} + 4x + \frac{4x^{-1}}{-1} + c$	K1	
		$1 = \frac{1^3}{3} + 4(1) - \frac{4}{1} + c$	K1	
		$y = \frac{x^3}{3} + 4x - \frac{4}{x} + \frac{2}{3}$	N1	3
	b	$\left[-\frac{2x^2}{2} + 3x \right]_{-2}^0 @ \frac{1}{2}(3+7)(2) @ \left[-\frac{x^4}{4} - \frac{x^3}{3} + 3x \right]_{-2}^0$	K1	
		$0 - \left[-\frac{2(-2)^2}{2} + 3(-2) \right] @ 0 - \left[-\frac{(-2)^4}{4} - \frac{(-2)^3}{3} + 3(-2) \right]$	K1	
		$10 - \frac{22}{3}$	K1	
		$\frac{8}{3}$	N1	4
				7

SOALAN 3 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 2 (KERTAS 1)

10	$\frac{1}{2} \left[\frac{2}{x+5} - 3 \right]_{-1}^2$	P1	
	$\frac{1}{2} \left[\left(\frac{2}{2+5} - 3 \right) - \left(\frac{2}{-1+5} - 3 \right) \right]$	K1	
	$-\frac{3}{28}$	N1	
		3	

SOALAN 4 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 2 (KERTAS 2)

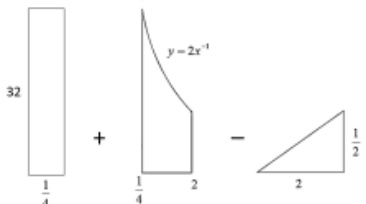
6	a	$y = \frac{x^3}{3} + 2x + \frac{x^{-1}}{-1} + c$	K1	
		$2 = \frac{1^3}{3} + 2(1) - \frac{1}{1} + c$	K1	
		$y = \frac{x^3}{3} + 2x - \frac{1}{x} + \frac{2}{3}$	N1	
	b	$\left[\frac{2x^2}{2} + 3x \right]_0^2 @ \frac{1}{2}(3+7)(2) @ \left[\frac{x^4}{4} - \frac{x^3}{3} + 3x \right]_0^2$	K1	

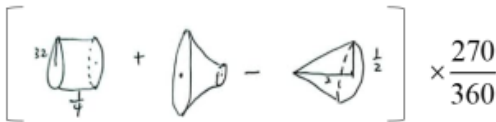
	$[2^2 + 3(2)] - 0$ @ $\left[\frac{(2)^4}{4} - \frac{(2)^3}{3} + 3(2)\right] - 0$	K1	
	$10 - \frac{22}{3}$	K1	
	$\frac{8}{3}$	N1	
		7	

SOALAN 5: SOALAN PERCUBAAN SPM SABAH (KERTAS 1)

4	(a) $2(x + \delta x)^2 - 3(x + \delta x)$ had $\frac{[2(x + \delta x)^2 - 3(x + \delta x)] - (2x^2 - 3x)}{\delta x}$ $\frac{dy}{dx} = 4x - 3$ Nota: δx boleh diganti dengan apa-apa pembolehubah kecuali x dan y. (b) Kamir $\frac{x^4 - 8x^2}{3x}$ terhadap x $\left(y = \frac{1}{12}x^4 - \frac{4}{3}x^2 + c\right)$ Ganti $(2, -1)$ ke dalam *kamiran DAN Selesaikan untuk c $-1 = \frac{1}{12}(2)^4 - \frac{4}{3}(2)^2 + c$ $c = 3$ $y = \frac{1}{12}x^4 - \frac{4}{3}x^2 + 3$	P1 K1 N1 K1 K1 N1	6	
----------	--	---	----------	--

SOALAN 6: SOALAN PERCUBAAN SPM SABAH (KERTAS 2)

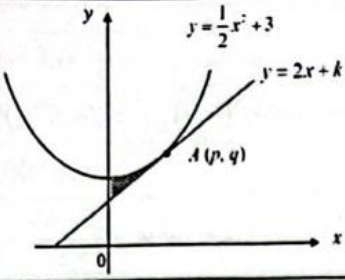
10	(a) Hapus satu anu bagi $y = \frac{2}{x^2}$ dan $x = 4y$ $\frac{2}{x^2} = \frac{x}{4}$ $A\left(2, \frac{1}{2}\right)$	K1	10	
		N1		
	(b) Kamir $\frac{2}{x^2}$ terhadap x Guna had $\int_{\frac{1}{4}}^2$ ke dalam *kamiran, $\left[\frac{2(2)^{-1}}{-1} - \left(\frac{2(\frac{1}{4})^{-1}}{-1} \right) \right]_{\frac{1}{4}}^2 @ 32\left(\frac{1}{4}\right) \text{ dan } \frac{1}{2}(2)\left(\frac{1}{2}\right)$	K1		
		K1		
	$A_1 = 7, A_2 = 8, A_3 = \frac{1}{2}$ $*A_1 + *A_2 - *A_3$ $14\frac{1}{2}$ Nota:  $32\left(\frac{1}{4}\right) + \int_{\frac{1}{4}}^2 2x^{-2} dx - \frac{1}{2}(2)\left(\frac{1}{2}\right)$	K1		
		N1		

	(c) Kamir $4x^{-4}$ terhadap x dan guna had $\int_{\frac{1}{4}}^2$ ke dalam *kamiran $V_1 = 85\frac{1}{6}\pi$ $\pi(32)^2\left(\frac{1}{4}\right) @ \frac{1}{3}\pi\left(\frac{1}{2}\right)^2(2)$ $V_2 = 256\pi, V_3 = \frac{1}{6}\pi$ $(*V_1 + *V_2 - *V_3) \times \frac{270}{360}$ $255\frac{3}{4}\pi$ Nota:  $\left[\pi(32)^2\left(\frac{1}{4}\right) + \int_{\frac{1}{4}}^2 \pi(4x^{-4})dx - \frac{1}{3}\pi\left(\frac{1}{2}\right)^2(2) \right] \times \frac{270}{360}$	K1 K1 K1 N1		
--	--	---	--	--

SOALAN 7: SOALAN PERCUBAAN SPM NEGERI SEMBILAN (KERTAS 1)

10	(a)	$\int_0^2 2g(x)dx + \int_0^2 1dx$ atau $[x]$	K1
		$\frac{7}{8(3-x)^2}$	K1
		$\frac{7}{8(3-2)^2} - \frac{7}{8(3-0)^2} + 2 - 0$	K1
		$\frac{25}{9}$	N1
	(b)	$\int_{4p}^{4p} f(x)dx = 2p - 1$	K1
		$2p - 1 = 0$	K1
		$\frac{1}{2}$	N1
			7

SOALAN 8: SOALAN PERCUBAAN SPM NEGERI SEMBILAN (KERTAS 2)

9	(a)		N1	
	(b) (i)	$\frac{dy}{dx} = x$ atau $x = 2$	K1	
		$A(2, 5)$, $k = 1$	N1, N1	
	(ii)	$\left[\frac{1}{2} \left(\frac{x^3}{3} \right) + 3x \right]$ atau $\left[\frac{2x^2}{2} + x \right]$	K1	
		$\left[\frac{1}{2} \left(\frac{2^3}{3} \right) + 3(2) - 0 \right] - \left[\frac{2(2)^2}{2} + 2 - 0 \right]$	K1	
		$\frac{4}{3}$	N1	
	(c)	$\pi \left[\frac{2y^2}{2} - 6y \right]$	K1	
		$\pi \left[\left(\frac{2(*5)^2}{2} - 6(*5) \right) - \left(\frac{2(3)^2}{2} - 6(3) \right) \right]$	K1	
		4π	N1	
			10	

SOALAN 9: SOALAN PERCUBAAN SPM KELANTAN (KERTAS 1)

7	(a)	0 NMA	1	
	(b)	$\left[-\frac{2}{3}x^3 + 6x^2 - 21x \right]_1^2$ atau $\left(-\frac{2}{3}(2)^3 + 6(2)^2 - 21(2) \right) - \left(-\frac{2}{3}(1)^3 + 6(1)^2 - 21(1) \right)$	1	
		$-\frac{23}{3} = 2m - 1$	1	
		$m = -\frac{10}{3}$	1	4

SOALAN 10 : SOALAN PERCUBAAN SPM KELANTAN (KERTAS 2)

8	(a)	$4k + 2m = 11$ atau $\left[\frac{kx^{2+1}}{2+1} + 2mx\right]_0^2 = \frac{34}{3}$	1	10
		Selesaikan persamaan $4k + 2m = 11$ dan $4k + 6m = 17$	1	
		$k = 2$	1	
		$m = \frac{3}{2}$	1	
	(b)	$m_1 = 8$ dan $(8)(m_2) = -1$ $m_2 = -\frac{1}{8}$	1	
		$y - 11 = -\frac{1}{8}(x - 2)$ atau setara $x + 8y = 90$ atau setara	1 1	
	(c)	$\pi \left[\frac{y^{1+1}}{2(1+1)} - \frac{3}{2}y \right]_3^6$ atau $\pi \left[\frac{y^2}{2(2)} - \frac{3}{2}y \right]_3^6$	1	
		$\pi \left(\left[\frac{(6)^2}{4} - \frac{3}{2}(6) \right] - \left[\frac{(3)^2}{4} - \frac{3}{2}(3) \right] \right)$	1	
		$\frac{9}{2}\pi$	1	

SOALAN 11: SOALAN PERCUBAAN SPM PAHANG SET 1 (KERTAS 1)

12	(a)	$\frac{\text{Kamir}(2x+k) \text{ terhadap } x}{\frac{2x^2}{2} + kx + c}$	K1	12
		Ganti $(3,10)$ ke dalam $y = \frac{2x^2}{2} + kx + c$ dan selesaikan c	K1	
		$y = x^2 + kx + 1 - 3k$	N1	
	(b)	(i) Kamir $(x^2 + kx + 1 - 3k)$ terhadap x DAN Samakan dengan 30 $\left[\frac{x^3}{3} + \frac{kx^2}{2} + x - 3kx \right]_{-2}^4 = 30$	K1	

			Guna had $\int_{-2}^4$ ke dalam kamirannya $\left[\left(\frac{(4)^3}{3} + \frac{(4)^2}{2}k + (4) - 3k(4) \right) - \left(\frac{(-2)^3}{3} + \frac{(-2)^2}{2}k + (-2) - 3k(-2) \right) \right] = 30$	K1	
			$k = 0$	N1	

		(ii)	$y = 17$ Dilihat DAN Guna rumus isipadu silinder $V_1 = \pi (4)^2 (17)$	K1	
			Kamir $\pi (y-1)$ terhadap y DAN Guna had $\int_1^{17}$ ke dalam kamirannya $V_2 = \pi \left[\frac{y^2}{2} - y \right]$ $\pi \left[\left(\frac{(17)^2}{2} - (17) \right) - \left(\frac{(1)^2}{2} - (1) \right) \right]$	K1	
			$V_1 - V_2, (V_1 > V_2)$	K1	
			144π	N1	
					10

SOALAN 12: SOALAN PERCUBAAN SPM PAHANG SET 1 (KERTAS 2)

2	(a)		$\int 4 \left(2x^3 + \frac{1}{x^2} \right) dx = 2x^4 - \frac{4}{x}$	K1	
			$\frac{1}{4} \left(2x^4 - \frac{4}{x} \right)$	N1	
	(b)		$\int_{-1}^k 3 dx - 10 = 8$	K1	
			Kamir 3 terhadap x DAN Guna had $\int_{-1}^k$ ke dalam kamirannya $[3(k) - 3(-1)]$	K1	
			$k = 5$	N1	
					5

SOALAN 13: SOALAN PERCUBAAN SPM PERLIS (KERTAS 1)

2				
(a)	$\int_1^2 \frac{2(x^2-9)}{3x^2} dx$ $\int_1^2 \frac{2}{3} - \frac{6}{x^2} dx$ $\left[\left(\frac{2}{3}(2) + \frac{6}{2} \right) - \left(\frac{2}{3}(1) + \frac{6}{1} \right) \right] \quad (1\text{m})$ $\frac{-7}{3} \quad (1\text{m})$	2		
(b)	$g(x) = \frac{1}{2} \left(\frac{dy}{dx} \right) \quad (1\text{m})$ $\frac{1}{2} \left[\left(\frac{2(1)-1}{1^2} \right) - \left(\frac{2(-1)-1}{(-1)^2} \right) \right] \quad (1\text{m})$ $2 \quad (1\text{m})$	3	5	

SOALAN 14: SOALAN PERCUBAAN SPM PERLIS (KERTAS 2)

9 (a)	Selesaikan persamaan serentak (1m) $x(2x - 5) = 0$ $A = \left(\frac{5}{2}, \frac{5}{2}\right) \quad (1m)$ (b) Cari luas segitiga atau gantikan had $\int_2^5 2x^2 - 4x \, dx$ (1m) $A_1 = \frac{1}{2} \left(\frac{5}{2}\right) \left(\frac{5}{2}\right) \quad A_2 = \left[\left(\frac{2 \left(\frac{5}{2}\right)^3}{3} - \frac{4 \left(\frac{5}{2}\right)^2}{2} \right) - \left(\frac{2(2)^3}{3} - \frac{4(2)^2}{2} \right) \right]$ Kamirkan $\int 2x^2 - 4x \, dx$ (1m) $\left[\frac{2x^3}{3} - \frac{4x^2}{2} \right]$ $* A_1 - * A_2 + * A_3 \quad (1m)$ $\frac{125}{24} \text{ unit}^2 \quad (1m)$ (c) Kamirkan $\int \pi y^2 \, dx$ (1m) $\pi \left[\frac{4x^5}{5} - \frac{16x^4}{4} + \frac{16x^3}{3} \right] \text{ atau } \pi \left[\frac{x^3}{3} \right]$ Guna had $\int_2^5$ kedalam $\left[\frac{4x^5}{5} - \frac{16x^4}{4} + \frac{16x^3}{3} \right]$ (1m) $\pi \left(\frac{125}{24} - \frac{113}{120} \right) \quad (1m)$ $\frac{64}{15} \pi \text{ unit}^3 \quad (1m)$	2 4 4	10
------------------	--	----------------------------	-----------

	Atau $\left[\left(\left[\frac{6(1)^2}{2} \right] - \left[\frac{6(0)^2}{2} \right] \right) - \left(\left[\frac{10(1)^2}{2} - 4(1) \right] - \left[\frac{10\left(\frac{2}{5}\right)^2}{2} - 4\left(\frac{2}{5}\right) \right] \right) \right]$ $36 + \left(3 - \frac{9}{5} \right)$ $= 37\frac{1}{5} \text{ unit}^2 / \frac{186}{5} \text{ unit}^2 / 37.2 \text{ unit}^2$ N1	
	JUMLAH	8

SOALAN 15: SOALAN PERCUBAAN SPM KEDAH (KERTAS 1)

15. (a)	$6x = 10x - 4$ K1 $x = 1$ $y = 6(1) @ y = 10(1) - 4$ $(1, 6)$ N1	2
15. b)	ALTERNATIF A $6x = 10x - 4$ K1 $x = 1$ Bila $x = 1 \rightarrow y = 6(1) = 6$, Bila $y = 0 \rightarrow 0 = 10x - 4$ $x = \frac{2}{5} @ 0.4$ $y = 6x + x^2$ dilihat K1 Area = $\left \int_{-6}^0 (6x + x^2) dx \right + \frac{1}{2}(1)(6) - \frac{1}{2}(6)\left(1 - \frac{2}{5}\right)$ K1 kamiran [abaikan tanda mutlak] $= \left[\left[\frac{6x^2}{2} + \frac{x^3}{3} \right]_{-6}^0 \right] + (3 - 1.8)$ K1 jumlah luas $= \left[\left(\left[\frac{6(0)^2}{2} + \frac{0^3}{3} \right] - \left(\frac{6(-6)^2}{2} + \frac{(-6)^3}{3} \right) \right) \right] + 1.2$ K1 ganti nilai $= -36 + 1.2$ $= 37\frac{1}{5} \text{ unit}^2 / \frac{186}{5} \text{ unit}^2 / 37.2 \text{ unit}^2$ N1 [N0 jika abaikan tanda mutlak] ALTERNATIF B $6x = 10x - 4$ K1 $x = 1$ $y = 6x + x^2$ dilihat K1 $\left[\left[\frac{6x^2}{2} + \frac{x^3}{3} \right]_{-6}^0 \right]$ K1 kamiran betul $\left[\left[\frac{6x^2}{2} + \frac{x^3}{3} \right]_{-6}^0 - \left(\left[\frac{6x^2}{2} \right]_0^1 - \left[\frac{10x^2}{2} - 4x \right]_{\frac{2}{5}}^1 \right) \right]$ K1 kamiran dan ganti had dengan betul $\left[\left[\frac{6(0)^2}{2} + \frac{(0)^3}{3} \right] - \left[\frac{6(-6)^2}{2} + \frac{(-6)^3}{3} \right] \right]$ K1 ganti nilai	6

SOALAN 16: SOALAN PERCUBAAN SPM KEDAH (KERTAS 2)

8(a)

ALTERNATIF A

$$x = 28$$

@

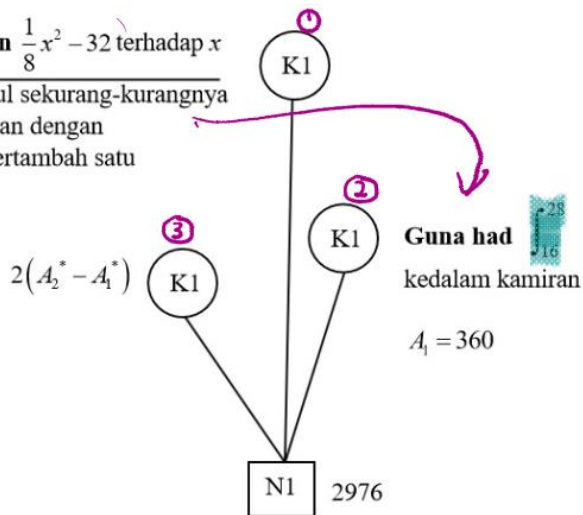
$$A_2 = 66 \times 28$$

$$A_2 = 1848$$

P1

Kamirkan $\frac{1}{8}x^2 - 32$ terhadap x

Mesti betul sekurang-kurangnya
satu sebutan dengan
kuasa x bertambah satu



ALTERNATIF B

$$x = (8y + 256)^{\frac{1}{2}}$$

P1

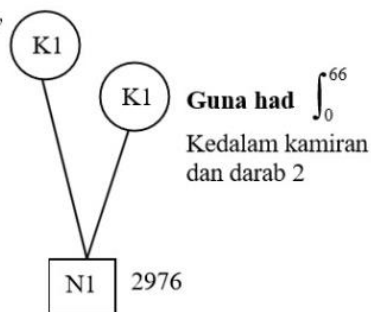
tersirat

$$\int_0^{66} (8y + 256)^{\frac{1}{2}} dy$$

P1

Kamirkan $(8y + 256)^{\frac{1}{2}}$ terhadap y

Mesti betul sekurang-kurangnya
satu sebutan dengan kuasa y
bertambah satu



5

8(b)

$$x^2 = 8y + 256$$

(P1) dilihat

Kamirkan $8y + 256$ terhadap y

dan guna had $\int_0^{66}$ ke dalam kamiran.

(K1)

(N1)

$$34320\pi$$

$$\frac{*34320\pi}{80\pi} \times 1.20$$

(P1)

(N1)

$$514.80$$

5

10

MODUL TOPIKAL

SOALAN PERCUBAAN SPM 2024

TOPIK TINGKATAN 5 **BAB 4**

PILIHATUR DAN GABUNGAN **(PERMUTATION AND COMBINATION)**

SUMBER SOALAN:
SOALAN – SOALAN PERCUBAAN SPM NEGERI
TAHUN 2024

SKEMA JAWAPAN

Modul Pintas Selangor Set 1
Modul Pintas Selangor Set 2
Sabah
Negeri Sembilan
Kelantan
Pahang Set 1
Perlis
Kedah

DISUSUN OLEH:
PN. NOORUL HUDA BINTI MOHD HASHIM
(SMK TAMAN TASIK, TAIPING)

PN ZAINAB BINTI ABD RAHMAN
(SMK CONVENT, TAIPING)

SOALAN 1 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 1(KERTAS 1)

9	a	$\frac{8!}{2! \times 2! \times 2! \times 2!} @ \frac{{}^8P_8 \times {}^1P_1}{2! \times 2! \times 2! \times 2!}$		K1	
		2520		N1	
	b	i	${}^3C_1 \times {}^3C_1 \times {}^2C_1$	K1	
			18	N1	
		ii	$({}^3C_2 \times {}^3C_1 \times {}^2C_1) \text{ or } ({}^3C_1 \times {}^3C_2 \times {}^2C_1) \text{ or } ({}^3C_1 \times {}^3C_1 \times {}^2C_2)$	K1	
			$({}^3C_2 \times {}^3C_1 \times {}^2C_1) + ({}^3C_1 \times {}^3C_2 \times {}^2C_1) + ({}^3C_1 \times {}^3C_1 \times {}^2C_2)$	K1	
			45	N1	
				7	

SOALAN 2 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 2(KERTAS 1)

9	a	$\frac{6! \times 1}{2! \times 2! \times 2!} @ \frac{{}^6P_6 \times {}^1P_1}{2! \times 2! \times 2!}$		K1	
		90		N1	
	b	i	${}^3C_1 \times {}^3C_1 \times {}^4C_1$	K1	
			36	N1	
		ii	${}^3C_2 \times {}^3C_1 \times {}^4C_1 @ {}^3C_1 \times {}^3C_2 \times {}^4C_1 @ {}^3C_1 \times {}^3C_1 \times {}^4C_2$	K1	
			$({}^3C_2 \times {}^3C_1 \times {}^4C_1) + ({}^3C_1 \times {}^3C_2 \times {}^4C_1) + ({}^3C_1 \times {}^3C_1 \times {}^4C_2)$	K1	
			126	N1	
				7	

SOALAN 3: SOALAN PERCUBAAN SPM SABAH (KERTAS 1)

10	(a)		K1	8	
	$(1 \times {}^4P_2 \times {}^3P_1) @ (1 \times {}^4P_2 \times {}^2P_1)$		K1		
	$(1 \times {}^4P_2 \times {}^3P_1) + (1 \times {}^4P_2 \times {}^2P_1)$		N1		
	60				
	(b) i)		K1		
	${}^5C_2 \times {}^4C_2$		N1		
	60				
	ii)		K1		
	${}^5C_2 \times {}^4C_1 @ {}^5C_1 \times {}^4C_2$		K1		
	${}^5C_2 \times {}^4C_1 + {}^5C_1 \times {}^4C_2$		K1		
	70		N1		

SOALAN 4 : SOALAN PERCUBAAN SPM NEGERI SEMBILAN (KERTAS 1)

11	(a)	$3 \times 2 \times 2 \times 1 \times 1 \times 1 \times 3$ atau setara	K1
		$3 \times 2 \times 2 \times 1 \times 1 \times 1 \times 3 \times 5$ atau setara	K1
		180	N1
	(b)	${}^8C_3 \times {}^nC_2$ atau ${}^8C_4 \times {}^nC_1$ atau ${}^8C_5 \times {}^nC_0$	K1
		$\frac{n(n-1)(n-2)!}{(n-2)!2!}$	K1
		$\frac{56n(n-1)(n-2)!}{(n-2)!2!} + 70n + 56 = 1316$	K1
		6	N1
			7

SOALAN 5: SOALAN PERCUBAAN SPM KELANTAN (KERTAS 1)

12	(a)	(i)	${}^{10}C_4 = 210$	1	
		(ii)	${}^4C_4 \times {}^6C_1$	1	
			6	1	
	(b)	(i)	$\frac{8!}{2!} = 20160$	1	
		(ii)	$\frac{4! \times 5!}{2!}$	1	
			1440	1	6

SOALAN 6: SOALAN PERCUBAAN SPM PAHANG SET 1 (KERTAS 1)

9	(a)	(i)	${}^{18}P_4 \times {}^{14}C_8$	K1	
			220 540 320	N1	
		(ii)	${}^2P_2 \times {}^6P_2 \times {}^{14}C_8$	K1	
			180 180	N1	
	(b)		$(11-1)!$	K1	
			$(11-1)! \times 2!$	K1	
			7 257 600	N1	
					7

3				
(a)	$3 \times {}^4P_4$ 1m 72 1m	2		
(b)	${}^4C_2 \times {}^6C_2$ or ${}^4C_3 \times {}^6C_1$ 1m ${}^4C_2 \times {}^6C_2 + {}^4C_3 \times {}^6C_1 + {}^4C_4$ 1m 115 1m	3	5	

SOALAN 8: SOALAN PERCUBAAN SPM KEDAH (KERTAS 1)

11 a) (i)	$\frac{6!}{2!} = 360$ atau setara ; $\frac{{}^6P_6}{2!} / \frac{{}^6C_6 \times 6!}{2!}$ N1	1	7	
11 a) (ii)	$5! = 120$ atau $\frac{5! \times 2!}{2!} = 120$ N1	1		
11 b)	<u>Pusingan 1:</u> Iriz & Saga [Assuming] $= 2C1 \times 1C1 \times 6C2 \times 6C3 \times 3C3 = 600$ & Tukar Kereta = 1 cara NOTA: 2C1 = Pilih pemandu untuk kereta 1 1C1 = Pilih pemandu untuk kereta 2 6C2 = Pilih dua kereta daripada 6 kereta 6C3 = Pilih 3 penumpang daripada 6 penumpang untuk kereta 1 3C3 = Pilih 3 penumpang daripada 3 penumpang untuk kereta 2 <u>Pusingan 2:</u> x50 & x70 [Assuming] $= 2C1 \times 1C1 \times 4C2 \times 6C3 \times 3C3 = 240$ & Tukar Kereta = 1 cara NOTA: 2C1 = Pilih pemandu untuk kereta 1 1C1 = Pilih pemandu untuk kereta 2 4C2 = Pilih dua kereta daripada 4 kereta 6C3 = Pilih 3 penumpang daripada 6 penumpang untuk kereta 1 3C3 = Pilih 3 penumpang daripada 3 penumpang untuk kereta 2 <u>Pusingan 3:</u> Persona & Exora [Assuming] $= 2C1 \times 1C1 \times 2C2 \times 6C3 \times 3C3 = 40$ & Tukar Kereta = 1 cara NOTA: 2C1 = Pilih pemandu untuk kereta 1 1C1 = Pilih pemandu untuk kereta 2 2C2 = Pilih dua kereta daripada 2 kereta 6C3 = Pilih 3 penumpang daripada 6 penumpang untuk kereta 1 3C3 = Pilih 3 penumpang daripada 3 penumpang untuk kereta 2 Mana-mana satu kiraan di atas betul atau setara [1 m] Bilangan Cara = $600(1) + 240(1) + 40(1)$ [1 m] $= 880$ [1 m]	3		
11 c)	$2! =$ Susun x50 dan x70 bersebelahan $(5-1)! =$ Susun keenam-enam model dalam bulatan Bilangan susunan berbeza $= 2!(5-1)! \quad \text{atau} \quad \frac{5!}{5} \times 2!$ K1 $= 48$ N1	2		

MODUL TOPIKAL

SOALAN PERCUBAAN SPM 2024

TOPIK TINGKATAN 5 **BAB 5**

PROBABILITY DISTRIBUTION **(TABURAN KEBARANGKALIAN)**

SUMBER SOALAN:
SOALAN – SOALAN PERCUBAAN SPM NEGERI
TAHUN 2024

SKEMA JAWAPAN

Modul Pintas Selangor Set 1
Modul Pintas Selangor Set 2
Sabah
Negeri Sembilan
Kelantan
Pahang Set 1
Perlis
Kedah

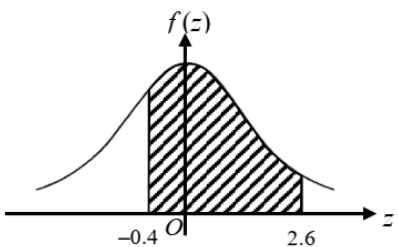
DISUSUN OLEH:
PN. NOORUL HUDA BINTI MOHD HASHIM
(SMK TAMAN TASIK, TAIPING)

PN ZAINAB BINTI ABD RAHMAN
(SMK CONVENT, TAIPING)

SOALAN 1 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 1(KERTAS 1)

12	a	${}^nC_n(0.75)^n(0.25)^0 = 0.5625$ $(0.75)^n = (0.75)^2$ 2	K1 K1 N1	5
	b	$2 \times \frac{3}{4}$ $\frac{3}{2}$	K1 N1	

SOALAN 2 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 1(KERTAS 2)

11	a	(i)	$P(X=6) = {}^8C_6 \times (0.1)^6 \times (0.9)^2$ 0.00002268	K1 N1	5
		(ii)	$0.15 > {}^nC_0 \times (0.1)^0 \times (0.9)^{n-0}$ $\log_{10} 0.15 > \log_{10} 0.9^n$ $n=19$	K1 K1 N1	
	b	(i)	$\sigma_K = \sqrt{400 \times 0.5 \times 0.5} = 10$ @ $\sigma_L = \sqrt{300 \times \frac{2}{3} \times \frac{1}{3}} = 8.165$ Lengkung A kerana sisihan piawai K lebih besar daripada L.	K1 N1	5
		(ii)	12 $P\left(\frac{10-12}{5} < Z < \frac{25-12}{5}\right)$ 	N1 K1 N1	

SOALAN 3 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 2 (KERTAS 1)

12	a	${}^nC_1(0.25)^1(0.75)^{n-1} = 10$ ${}^nC_0(0.25)^0(0.75)^n$ $0.025n = 0.75$ @ setara 30	K1 K1 N1
	b	$30(0.25)(0.75)$ 5.625	K1 N1
			5

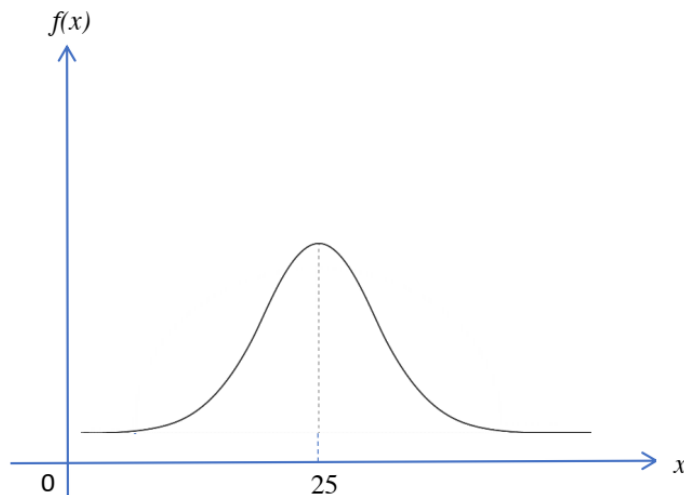
SOALAN 4 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 2 (KERTAS 2)

11	a	i	$P(X = 6) = {}^8C_6 \times (0.1)^6 \times (0.9)^2$ $= 0.00002268$	K1 N1
		ii	$0.15 > {}^nC_0 \times (0.1)^0 \times (0.9)^{n-0}$ $\log_{10} 0.15 > \log_{10} 0.9^n$ $n=19$	K1 K1 N1
	b	i	$P\left(Z > \frac{300-210}{35}\right)$ 0.00506	K1 N1
		ii	$P\left(Z > \frac{m-210}{35}\right) = 0.98$ $\frac{m-210}{35} = -2.054$ $m = 138.11$	K1 K1 N1
				10

SOALAN 5: SOALAN PERCUBAAN SPM NEGERI SABAH (KERTAS 1)

8

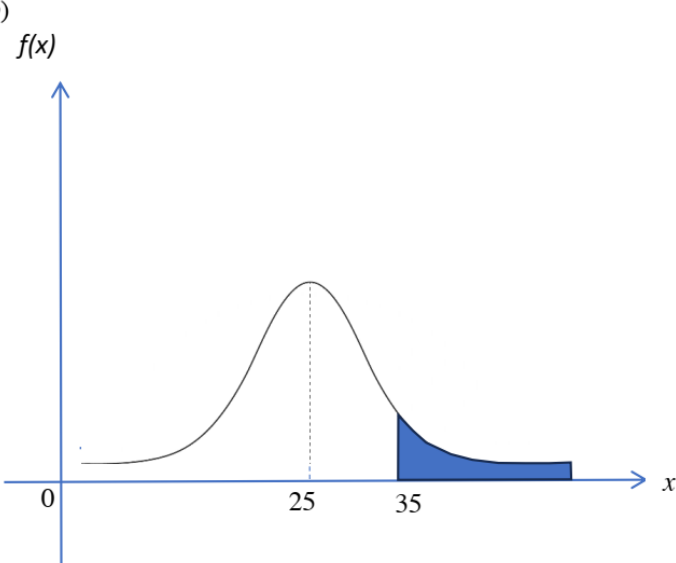
(a)



Bentuk graf taburan normal
Paksi-x dilabel x
Paksi-y dilabel $f(x)$
Kedua-dua paksi menggunakan pembaris
Paksi simetri dilabel dengan 25

P1

4

	(b)  Bentuk graf taburan normal Paksi-x dilabel x Paksi-y dilabel $f(x)$ Kedua-dua paksi menggunakan pembaris Paksi simetri dilabel dengan 25 Garis 35 dan lorekkan sebelah kanan $P(Z > \frac{35-25}{6.3})$ 0.0563	P1 K1 N1		
--	--	----------------------------	--	--

SOALAN 6: SOALAN PERCUBAAN SPM NEGERI SABAH (KERTAS 1)

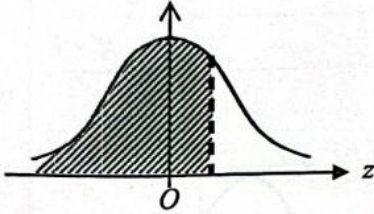
9	(a)		4	
	$P(X = 4) + P(X = 5)$			
	${}^5C_4 \times 0.75^4 \times 0.25^1 + {}^5C_5 \times 0.75^5 \times 0.25^0$	K1		
	0.6328	N1		
	(b)			
	$P(X = 5) + P(X = 6)$			
	${}^6C_5 \times {}^*0.6328^5 \times (1 - {}^*0.6328)^1 +$	K1		
	${}^6C_6 \times {}^*0.6328^6 \times (1 - {}^*0.6328)^0$			
	0.2878	N1		

SOALAN 7: SOALAN PERCUBAAN SPM SABAH (KERTAS 2)				
9	a) i) $r = ab \text{ or } \text{Min} = ab \text{ or } \mu = ab$ $s = ab(1 - b) \text{ or } \text{Varians} = ab(1 - b) \text{ or } \sigma^2 = ab(1 - b)$ $s = ab - ab^2 \text{ or } \text{Varians} = ab - ab^2 \text{ or } \sigma^2 = ab - ab^2$ ii) $P(X = 7)$ $= {}^{10}C_7 \times 0.85^7 \times 0.15^3$ $= 0.1298$ b) i) Tulis $P\left(Z \geq \frac{x-150}{10}\right) = \frac{350}{500}$ $\frac{x-150}{10} = -0.524$ 144.76	K1 N1 K1 N1 P1 K1 N1	10	
	ii) $P\left(Z \geq \frac{120-\mu}{10}\right) = 0.9 \text{ dan } 1 - P\left(Z > -\left(\frac{120-\mu}{10}\right)\right) = 0.9$ @ OR $P(Z \geq \beta) = 0.9 \text{ dan } 1 - P(Z > -\beta) = 0.1$ @ $\frac{120-\mu}{10} = -1.281 \text{ // } -1.282$ $132.81 \text{ // } 132.82$	K1 K1 N1		

SOALAN 8: SOALAN PERCUBAAN SPM NEGERI SEMBILAN (KERTAS 1)

12	(a)(i)	$1 - k - m$	P1
	(ii)	${}^3C_3 p^3 q^0 = \frac{1}{64}$	K1
		$p = \frac{1}{4}$ atau 0.25	N1
	(b)	$P\left(Z \geq \frac{8-15}{\sigma}\right) = 0.6844$ atau $z = (-)0.48$	K1
		$\frac{8-15}{\sigma} = -0.48$	K1
		$\sigma = 14.58$	N1
			6

SOALAN 9: SOALAN PERCUBAAN SPM NEGERI SEMBILAN (KERTAS 2)

11	(a)(i)	$\mu = 9 \times 0.4$	K1
		$\mu = 3.6$	N1
	(ii)	$P(X \geq 8) = {}^9C_8 (0.4)^8 (0.6)^1 + {}^9C_9 (0.4)^9 (0.6)^0$	K1
		0.003801	N1
	(b)(i)	$z = \frac{44-35}{4.5}$ atau $z = 2$	K1
		0.0228	N1
	(ii)		P1
		$P\left(Z < \frac{k-35}{4.5}\right) = 0.56$ atau $z = 0.151$	K1
		$\frac{k-35}{4.5} = 0.151$	K1
		$k = 35.68$	N1
			10

SOALAN 10: SOALAN PERCUBAAN SPM KELANTAN (KERTAS 1)

9	(a)	$z = \frac{63.2 - 48}{12}$ $z = 1.267$	1	1	
	(b)	Lakar graf taburan normal dan lorek kawasan yang betul (catatan: mesti menggunakan alat tepi lurus untuk kedua-dua paksi)			
		$\frac{k - 48}{12} = -0.39$ $k = 43.32$	1	1	4

SOALAN 11: SOALAN PERCUBAAN SPM KELANTAN (KERTAS 1)

10	(a)	$P(X=r) = {}^6C_r \left(\frac{1}{5}\right)^r \left(\frac{4}{5}\right)^{6-r} \text{ or } {}^6C_r (0.2)^r (0.8)^{6-r}$ $P(X \geq 3) = P(X=3) + P(X=4) + P(X=5) + P(X=6)$ Atau $P(X \geq 3) = 1 - P(X=0) - P(X=1) - P(X=2)$ 0.09888	1	1	4
	(b)	$\sqrt{705 \times 0.2 \times 0.8} = 10.621$	1		

SOALAN 12: SOALAN PERCUBAAN SPM KELANTAN (KERTAS 2)

11	(a)	(i)	$3C1(0.5)(0.5)^2 + 3C2(0.5)^2(0.5)$ 0.75	1	1	
		(ii)	$\frac{20}{15} (0.75) \text{ OR } \sqrt{20 (0.75)(0.25)}$ 1.936	1	1	
	(b)	(i)	39	1		
		(ii)	$P\left(\frac{39-45}{8} \leq X \leq \frac{55-45}{8}\right)$ 0.6677	1	1	
		(iii)	$P\left(X \leq \frac{33-45}{8}\right) \text{ OR } 0.06681$ 12	1	1	10

SOALAN 13: SOALAN PERCUBAAN SPM PAHANG SET 1 (KERTAS 1)

10	(a)		$3b + \frac{2}{9} + a + 3b = 1$	K1	
			$a = \frac{7}{9} - 6b$	N1	
	(b)		$\left(\frac{7}{9} - 6b\right) + 3b$	K1	
			$3b = {}^3C_0 p^0 q^3$	K1	
			$\frac{7}{9} - q^3$	N1	
					5

SOALAN 14: SOALAN PERCUBAAN SPM PAHANG SET 1 (KERTAS 2)

8	(a)	(i)	$H = -0.97$	P1	
			$\frac{X - 165}{5} = -0.97$	K1	
			160.15	N1	
		(ii)	$P\left(\frac{165 - 165}{5}\right) < Z < \left(\frac{175 - 165}{5}\right)$	P1	
			$0.5 - 0.0228$ DAN 1500×0.4772	K1	
			715	N1	
	(b)	(i)	$P\left(Z > \frac{4 - 3}{0.65}\right)$	P1	
			0.0620	N1	
		(ii)	500×0.062	K1	
			31	N1	
					10

SOALAN 15: SOALAN PERCUBAAN SPM PERLIS (KERTAS 1)

4	$p = 0.75, \quad q = 0.25$		
a)	$P(x = 3) = {}^{10}C_3(0.25)^3(0.75)^7$ (1m) 0.2503 (1m)	2	
b)	$P(x > 8) = P(x = 9) + P(x = 10)$ (1m) $P(x > 8) = {}^{10}C_9(0.75)^9(0.25)^1 + {}^{10}C_{10}(0.75)^3(0.25)^0$ 0.2440 (1m)	2	4

SOALAN 16: SOALAN PERCUBAAN SPM PERLIS (KERTAS 2)

11

$$z = -2.0 \text{ atau } z = 0.667 \quad \boxed{1\text{m}}$$

(a)

$$P\left(Z > \frac{1.5-\mu}{\sigma}\right) = 0.0228 \text{ atau } P\left(Z > \frac{3.5-\mu}{\sigma}\right) = 0.252 \quad \textcircled{1\text{m}}$$

$$\frac{1.5-\mu}{\sigma} = -2.0$$

$$\frac{3.5-\mu}{\sigma} = 0.667$$

Selesaikan persamaan serentak

$\textcircled{1\text{m}}$

$$2.667\sigma = 2$$

$$\sigma = 0.7499$$

$\boxed{1\text{m}}$

$$\mu = 2.9998$$

$\textcircled{1\text{m}}$

5

(b)

(i)

$$1 - \left(\frac{5}{128} + \frac{21}{128} + \frac{21}{128} + \frac{61}{128}\right) \quad \textcircled{1\text{m}}$$

$$\frac{5}{32} \quad \boxed{1\text{m}}$$

2

(ii)

$${}^5C_2 \times p^2 \times q^3 + {}^5C_3 \times p^3 \times q^2 = \frac{5}{32} \quad \textcircled{1\text{m}}$$

$$q^2(p + q) = \frac{1}{64p^2}$$

Ganti $p + q = 1$

$\textcircled{1\text{m}}$

$$q = \frac{1}{8p}$$

$\textcircled{1\text{m}}$

3

10

SOALAN 17: SOALAN PERCUBAAN SPM KEDAH (KERTAS 1)

8 a)

X	0	1	2	3
$P(X=r)$	$\frac{8}{27}$	$\frac{4}{9}$	$\frac{2}{9}$	$\frac{1}{27}$

N1 betul bagi semua 4 data

OR

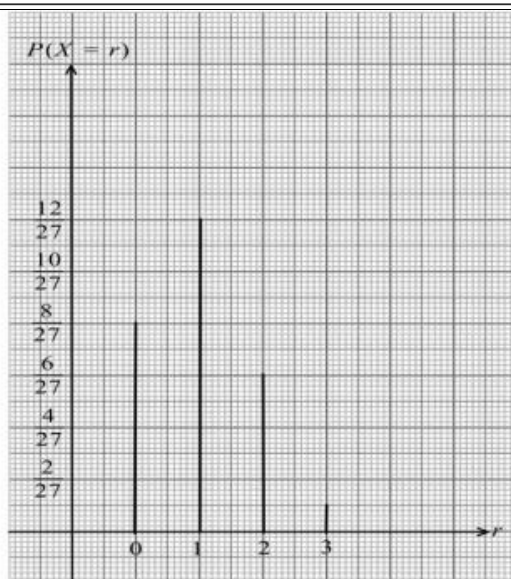
X	0	1	2	3
$P(X=r)$	0.2963	0.4444	0.2222	0.0370

Dengan syarat pembundaran betul kepada 4 titik perpuluhan

Rujuk graf pada muka surat 7

3

8



8 b)

$$P((a - b) < Y < (a + b)) = 0.84$$

8 b)

$$P((\mu - k) < X < (\mu + k)) = 0.84$$

$$P\left(\frac{65 - k - 65}{10} < Z < \frac{65 + k - 65}{10}\right) = 0.84 \quad \text{P1}$$

$$P\left(-\frac{k}{10} < Z < \frac{k}{10}\right) = 0.84 \quad \text{P1 [Graf dilukis dari sini]}$$

atau

$$1 - 2P\left(Z \geq \frac{k}{10}\right) = 0.84 \quad \text{atau} \quad 0.5 - P\left(Z \geq \frac{k}{10}\right) = 0.42 \quad \text{P1}$$

$$P\left(Z \geq \frac{k}{10}\right) = 0.08$$

$$P(Z \geq 1.406) = 0.08 \quad \text{P1 [dilihat 1.406]}$$

[1.406 Dibaca dari Jadual Normal Piawai]

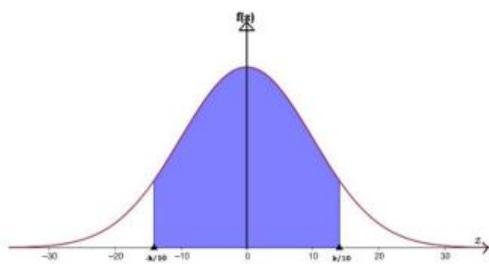
[tidak terima jawapan dari calculator = -1.4051]

$$\frac{k}{10} = 1.406$$

K1

$$k = 14.06$$

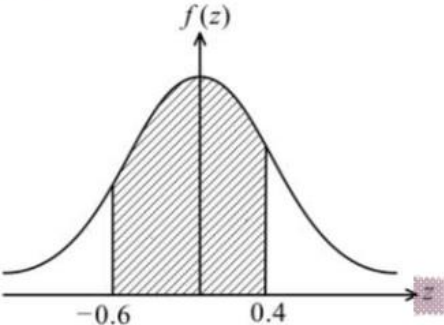
N1 [N0 jika tiada lakaran graf]



- (i) Guna pembaris / alat tepi lurus
- (ii) $-\frac{k}{10}$ dan $\frac{k}{10}$ mesti nampak
- (iii) Betul label paksi $f(z)$ dan z
- (iv) Lorekkan betul

5

SOALAN 18: SOALAN PERCUBAAN SPM KEDAH (KERTAS 2)

11(a)(i)	$0.35 + 0.08m + 0.20 + \frac{m}{25} + 0.03m = 1$ $(m=3)$ N1	2		
11(a)(ii)	0.2400 N1	1		
11(a)(iii)	$P(X \leq 2) = P(X=0) + P(X=1) + P(X=2)$ $0.35 + 0.08 + 0.20$ $P(X \leq 2) = 1 - P(X=4) - P(X=3)$ 0.4100 N1	2		
11(b)(i)	$P\left(\frac{80-86}{10} \leq z \leq \frac{90-86}{10}\right)$ @ $P(-0.6 \leq z \leq 0.4)$  Graf Normal Piawai berbentuk loceng dan z dilihat pada paksi mengufuk. Graf mesti dilukis menggunakan pembaris $P1$ N1	2		
11(b)(ii)	$1 - P(Z \geq 0.6)$ K1 $1 - P(Z > 0.6) @$ $1 - 0.2743$ 0.7257 N1 $1 - 0.2743$ $87 @ 88$ N1	3		10

MODUL TOPIKAL
SOALAN PERCUBAAN SPM 2024
TOPIK TINGKATAN 5
BAB 6

FUNGSI TRIGONOMETRI
(TRIGONOMETRIC FUNCTIONS)

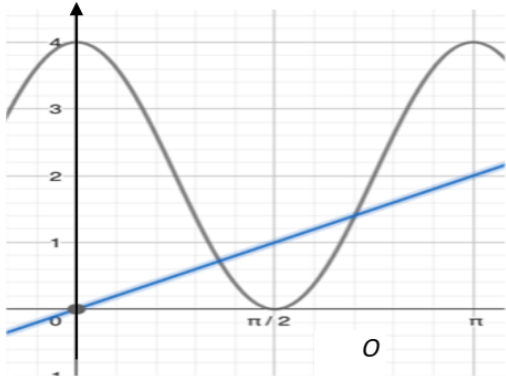
SUMBER SOALAN:
SOALAN – SOALAN PERCUBAAN SPM NEGERI
TAHAP 2024

SKEMA JAWAPAN

Modul Pintas Selangor Set 1
Modul Pintas Selangor Set 2
Sabah
Negeri Sembilan
Kelantan
Pahang Set 1
Perlis
Kedah

DISUSUN OLEH:
PN. NOORUL HUDA BINTI MOHD HASHIM
(SMK TAMAN TASIK, TAIPING)

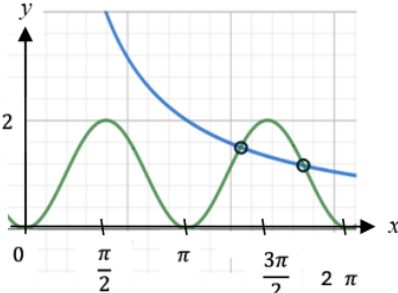
PN ZAINAB BINTI ABD RAHMAN
(SMK CONVENT, TAIPING)

SOALAN 1 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 1 (KERTAS 1)				
15	a	$\cos \alpha = \sqrt{1 - p^2}$ $\sec \alpha = \frac{1}{\sqrt{1 - p^2}}$	K1 N1	
	b	$\frac{(1 - \sin x)(2 - 2 \sin x) + 2 \cos^2 x}{(2 \cos x)(2 - 2 \sin x)}$ $\frac{2 - 4 \sin x + 2(1)}{4 \cos x(1 - \sin x)} @ \frac{4(1 - \sin x)}{4 \cos x(1 - \sin x)}$ $\frac{1}{\cos x}$ $\sec x$	K1 K1 N1	
	c	Sudut rujukan 60° $\cos 840^\circ = \cos (840^\circ - 720^\circ) \text{ or } -\cos 60^\circ$ $-\frac{1}{2}$	N1 K1 N1	
			8	
SOALAN 2 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 1 (KERTAS 2)				
5	a	 Bentuk graf cos sekurang-kurangnya 1 kitaran Bilangan kitaran dan amplitude yang betul Anjakan graf 2 unit ke atas Lukis garis $y = \frac{2x}{\pi}$ dengan betul Bilangan penyelesaian = 2	P1 P1 P1 K1 N1	5
	b	$2(\cos^2 x - \sin^2 x - 2 \cos^2 x) = 0$ $\sin x (2 \sin x - 1) = 0$ Sudut rujukan = $0^\circ, 30^\circ$ $0^\circ, 30^\circ, 150^\circ, 180^\circ, 360^\circ$	K1 K1 N1 N1	4
				9

SOALAN 3 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 2 (KERTAS 1)

15	a	$\sin \alpha = \sqrt{1-p^2}$ $\operatorname{kosek} \alpha = \frac{1}{\sqrt{1-p^2}}$	K1
			N1
	b	$\frac{(1+\cos x)^2 + \sin^2 x}{\sin x (1+\cos x)}$ $\frac{(1+\cos x)^2 + (1-\cos^2 x)}{\sin x (1+\cos x)}$ or $\frac{2(1+\cos x)}{\sin x (1+\cos x)}$ 2 kosek x	K1 K1 N1
c	i	Sudut rujukan 60° $-\cos(480^\circ - 360^\circ)$ @ $-\cos 60^\circ$ $-\frac{1}{2}$	N1 K1 N1
			8

SOALAN 4 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 2 (KERTAS 2)

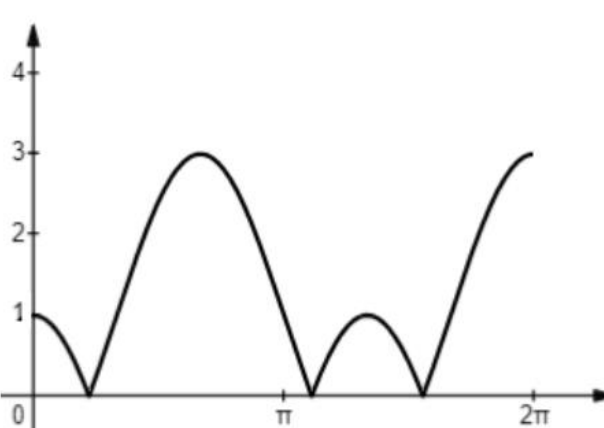
5	a	 Bentuk graf $y = -kx$ yang betul 2 kitaran dan amplitud yang betul $y = \frac{2\pi}{x}$ Garis $y = \frac{2\pi}{x}$ dilakar dengan betul Bilangan penyelesaian = 2	P1 P1 P1 K1 N1
	b	$\frac{1}{\tan x} + 2\cos x = 0$ @ $\frac{\cos x}{\sin x} + 2\cos x = 0$ $\cos x (1 + 2\sin x) = 0$ Sudut rujukan = $90^\circ, 30^\circ$ $90^\circ, 210^\circ, 270^\circ, 330^\circ$	K1 K1 N1 N1
			9

SOALAN 5: SOALAN PERCUBAAN SPM NEGERI SABAH (KERTAS 1)

13	(a) $\alpha = 60^\circ$ ref angle dilihat	P1	8	
	$5^\circ, 65^\circ, 185^\circ, 245^\circ$	N1		
	(b) $\cos \theta \cos \theta - \sin \theta \sin \theta$ $\cos^2 \theta - \sin^2 \theta$ $\cos 2\theta = 1 - 2 \sin^2 \theta$ Nota : Penggunaan $\cos^2 \theta = 1 - \sin^2 \theta$ dilihat	K1 N1		
	(i) $2 \left(\frac{1}{\sqrt{1+p^2}} \right) \left(-\frac{p}{\sqrt{1+p^2}} \right)$ $-\frac{1+p^2}{2p}$	K1 N1		
	(ii) $\frac{1}{\sqrt{1+p^2}} (0) - \left(-\frac{p}{\sqrt{1+p^2}} \right) (1)$ $\frac{p}{\sqrt{1+p^2}}$	K1 N1		

SOALAN 6: SOALAN PERCUBAAN SPM NEGERI SABAH (KERTAS 2)

6	(a) $\frac{\sin \theta \cos \frac{\pi}{2} + \cos \theta \sin \frac{\pi}{2}}{1 - \left(\cos \theta \cos \frac{\pi}{2} - \sin \theta \sin \frac{\pi}{2} \right)}$ $\frac{\cos \theta}{1 + \sin \theta}$ $\frac{\cos \theta (1 - \sin \theta)}{1 - \sin^2 \theta}$ $\frac{\cos \theta (1 - \sin \theta)}{\cos^2 \theta}$ $\frac{1 - \sin \theta}{\cos \theta}$ $\sec \theta - \tan \theta$	K1	
		N1	

	(b)  Bentuk graf kosinus $1\frac{1}{2}$ Kitaran Anjakan 1 unit ke bawah & Mutlak	P1 P1 P1		
	(c) $1 < t < 3$	N1		

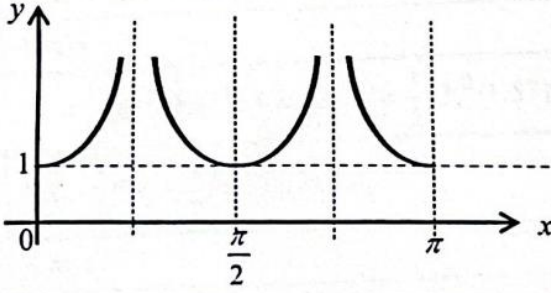
SOALAN 7: SOALAN PERCUBAAN SPM NEGERI SEMBILAN (KERTAS 1)

9	(a)	$\frac{1}{p}$	P1
	(b)	$p = 1 - 2 \sin^2 \frac{\theta}{2}$	K1
		$\sqrt{\frac{1-p}{2}}$	N1
			3

SOALAN 8: SOALAN PERCUBAAN SPM NEGERI SEMBILAN (KERTAS 1)

15	(a)	$\frac{a^2}{a^2} + \frac{b^2}{a^2} = \frac{c^2}{a^2}$, c ialah hipotenus segi tiga bersudut tegak.	K1
		$\tan^2 \theta + 1 = \sec^2 \theta$	N1
	(b)	$(2 \sin x - 1)(\sin x + 1) = 0$	K1
		sudut rujukan 30°	K1
		30° , 150° dan 270°	N1
	(c)	$\cos x \cos y + q = \frac{p}{q}$ atau $\left(\frac{p}{q} - q\right) - \sin x \sin y$	K1
	(i)	$\frac{p}{q} - q$	N1
	(ii)	$\frac{p}{q} - 2q$	N1
			8

SOALAN 9: SOALAN PERCUBAAN SPM NEGERI SEMBILAN (KERTAS 2)

5	(a)	$\frac{2 \sin x \cos x}{2 \cos^2 x - 1}$	K1
		$\tan 2x$	N1
	(b)		
		Graf $\tan x$ (paksi menggunakan pembaris)	P1
		Graf $ \tan 2x $ dan label 0 dan π	P1
		Graf $ \tan 2x + 1$ tepat dan label 1	P1
	(c)(i)	$y = kx$	P1
	(ii)	$k < \frac{1}{\pi}$	P1
			7

SOALAN 10: SOALAN PERCUBAAN SPM KELANTAN (KERTAS 1)

11	(a)	(i)	$-\cos 45$	1	8
			$-\frac{1}{\sqrt{2}}$	1	
		(ii)	$-\frac{1}{\tan 60}$ atau $-\frac{1}{\tan \frac{\pi}{3}}$	1	
			$-\frac{1}{\sqrt{3}}$	1	
	(b)		$3 \sin 2x - 2 \sin x - 1 = 0$	1	
			$\sin x = -\frac{1}{3}$ dan $\sin x = 1$	1	
			$x = 19.47^\circ$ atau $x = 90^\circ$ (sudut rujukan)	1	
			ATAU		
			$x = 0.1082\pi, x = \frac{1}{2}\pi$		
			$x = 1.108\pi, 1.891\pi, 0.5\pi$	1	

SOALAN 11: SOALAN PERCUBAAN SPM KELANTAN (KERTAS 2)

7	(a)		1			
	(b)	(i)	3	1		
		(ii)	$\begin{pmatrix} 0 \\ 1 \end{pmatrix}$	1		
				1		7

SOALAN 12: SOALAN PERCUBAAN SPM PAHANG SET 1 (KERTAS 1)

14	(a)	Guna mana-mana rumus sudut berganda $1 - (1 - 2 \sin^2 x) + 2 \sin x \cos x$ @ $1 + (1 - 2 \sin^2 x) + 2 \sin x \cos x$	K1	
		$\frac{\sin \theta}{\cos \theta}$	K1	
		$\tan \theta$	N1	
	(b)	Bentuk graf tangen negatif.	P1	
		1 kitaran dan bersama 2 asimptot	P1	
		Persamaan $y = \frac{2x}{\pi}$	P1	
		Lukis garis lurus kecerunan positif melalui asalan	K1	
		3	N1	
				8

SOALAN 13: SOALAN PERCUBAAN SPM PAHANG SET 1 (KERTAS 2)

4	(a)	(i)	$1 - 2\sin^2 x$	K1	
			$1 - 2a^2$	N1	
		(ii)	$\frac{a}{\sqrt{1-a^2}}$	N1	
	(b)	(i)	Guna rumus identiti	P1	
			$2\sin x \cos x = \sin 2x$	N1	
		(ii)	Sudut rujukan = 30°	P1	
			$2x = 30^\circ, 150^\circ, 390^\circ, 510^\circ$	K1	
			$\frac{\pi}{12}, \frac{5\pi}{12}, \frac{13\pi}{12}, \frac{17\pi}{12}$	N1	
					8

SOALAN 14: SOALAN PERCUBAAN SPM PERLIS (KERTAS 1)

15

(a)

Guna $\sin 2x = 2 \sin x \cos x$

1m

$$3(2 \sin x \cos x) = \sin x$$

$$\sin x(6 \sin x - 1) = 0$$

1m

$$\sin x = 0 \quad \text{atau} \quad 6 \sin x - 1 = 0$$

1m

$$x = 0^\circ, 180^\circ, 360^\circ \quad \text{atau} \quad x = 80.41^\circ, 279.59^\circ$$

1m

$$x = 0^\circ, 80.41^\circ, 180^\circ, 279.59^\circ, 360^\circ$$

1m

5

(b)

$$\tan x = \frac{-4}{3}$$

1m

Guna $\tan x = \frac{2 \tan x}{1 - \tan^2 x}$

1m

$$\frac{2\left(\frac{-4}{3}\right)}{1 - \left(\frac{-4}{3}\right)^2}$$

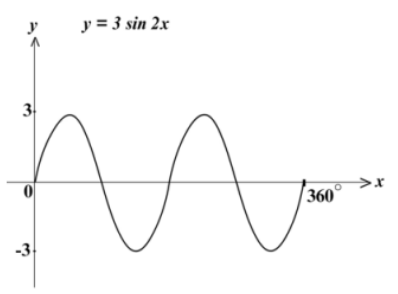
$$\frac{24}{7}$$

1m

3

8

SOALAN 15: SOALAN PERCUBAAN SPM PERLIS (KERTAS 2)

	2	(a) Guna $\sin^2 x + \cos^2 x = 1$ 1m $3 \sin 2x$ 1m (b) Sudut rujukan = 19.47° 1m $2x = 19.47^\circ, 160.53^\circ, 379.47^\circ, 520.53^\circ$ 1m $x = 9.735^\circ, 80.265^\circ, 189.375^\circ, 260.265^\circ$ 1m (c)  1m Bentuk graf sinus 1m 2 kalaan ($0^\circ \leq x \leq 360^\circ$) 1m Maksimum dan minimum 1m	2	
			3	
			3	8

SOALAN 16: SOALAN PERCUBAAN SPM KEDAH (KERTAS 1)

4 a) (i)	0	N1	1	5	
4 a) (ii)	$x = -\frac{\pi}{2}; x = -\frac{3}{2}\pi$	N1 [dilihat]	1		
4 b) (i)	$y = - \tan x $	N1	1		
4 b) (ii)	$-2\pi \leq x \leq 0$	N1 [terima $-\frac{5}{2}\pi \leq x \leq 0$]	1		
4 b) (iii)	$y \leq 0$	N1	1		

SOALAN 17: SOALAN PERCUBAAN SPM KEDAH (KERTAS 2)

2(a)

Guna

$$\tan 2A = \frac{\sin 2A}{\cos 2A} \quad @$$

$$\sec A = \frac{1}{\cos A} \quad @$$

$$\cos 2A = 2\cos^2 A - 1 \quad @$$

$$\sin 2A = 2\sin A \cos A$$

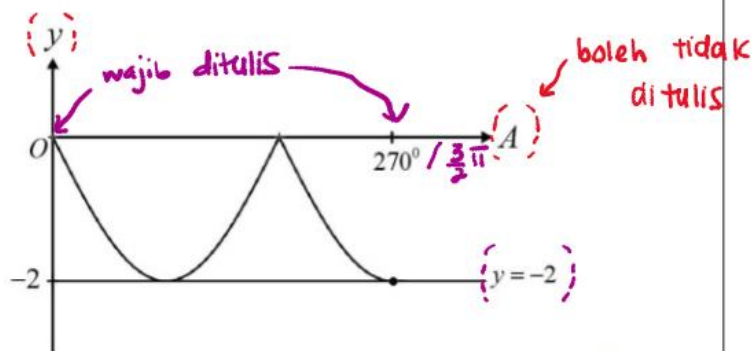


N1

Kiri = Kanan

2

2(b)



Bentuk graf sinus

P1¹

Amplitud = 2 (maksimum = 2 dan minimum = -2)

P1²

($0^\circ \leq A \leq 270^\circ$).

Pantulan dan nilai mutlak dalam $0^\circ \leq A \leq 270^\circ$

P1³

5

Lakar garis lurus $y = -2$



N1

$m = -2$

Nota:

1. **KO, NO**- jika garis lurus $y = -2$ dilukis tidak menggunakan pembaris
2. Abaikan graf diluar julat.
3. Bentuk graf P0, maka P0, P0

7

MODUL TOPIKAL
SOALAN PERCUBAAN SPM 2024
TOPIK TINGKATAN 5
BAB 7

PENGATURCARAAN LINEAR
(LINEAR PROGRAMMING)

SUMBER SOALAN:
SOALAN – SOALAN PERCUBAAN SPM NEGERI
TAHUN 2024

SKEMA JAWAPAN

Modul Pintas Selangor Set 1
Modul Pintas Selangor Set 2
Sabah
Negeri Sembilan
Kelantan
Pahang Set 1
Perlis
Kedah

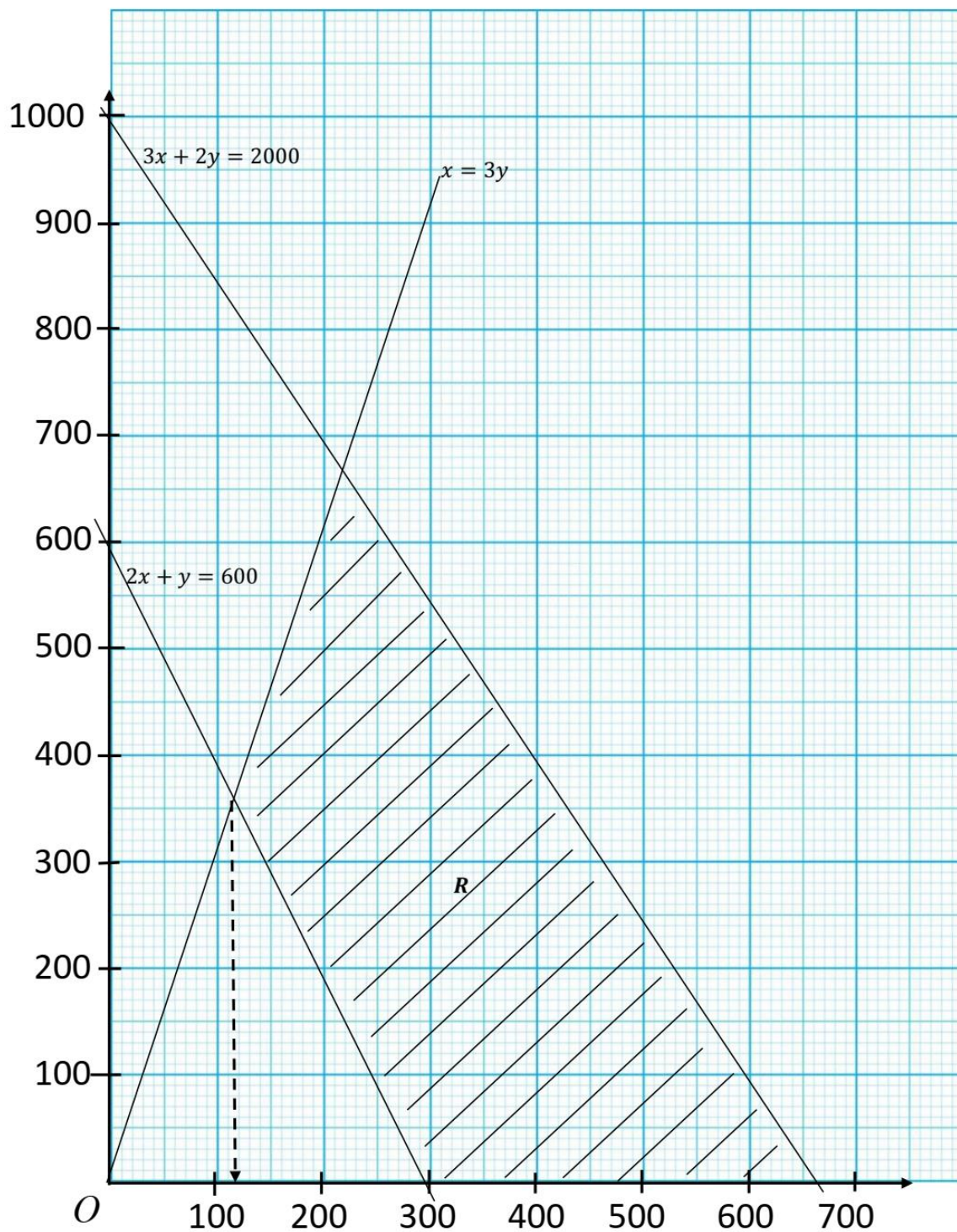
DISUSUN OLEH:
PN. NOORUL HUDA BINTI MOHD HASHIM
(SMK TAMAN TASIK, TAIPING)

PN ZAINAB BINTI ABD RAHMAN
(SMK CONVENT, TAIPING)

SOALAN 1 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 1(KERTAS 2)

15	a	(i) $x \geq \frac{1}{3}y$ or $y \leq 3x$		N1	3
		(ii) $3x + 2y \leq 2000$		N1	
		(iii) $2x + y \geq 600$		N1	
	b	• Lukis dengan betul sekurang-kurangnya satu garis lurus dari *ketaksamaan yang melibatkan x dan y pada paksi-paksi yang bermula dengan asalan.		K1	3
		• Lukis semua *garis lurus dengan betul dari semua *ketaksamaan yang melibatkan x dan y (terima garisan putus-putus dan garis padu).		N1	
		• Rantau dilorek dengan betul.		N1	
	c	(i)	120	N1	4
		(ii)	(400 , 400) @ Seen 400	N1	
Max Profit = $12(400) + 6(400)$			K1		
= RM7200			N1		
					10

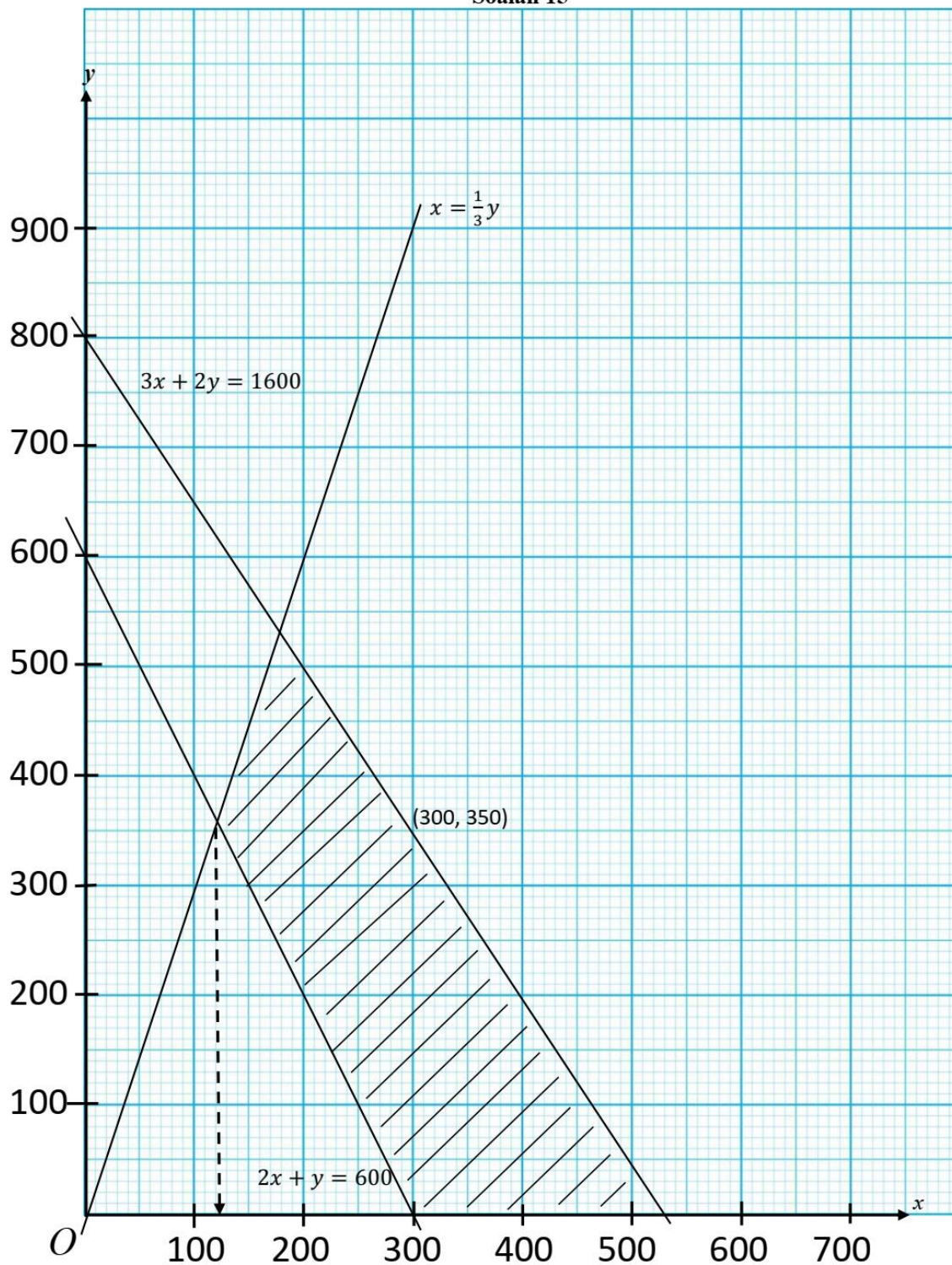
Soalan 15

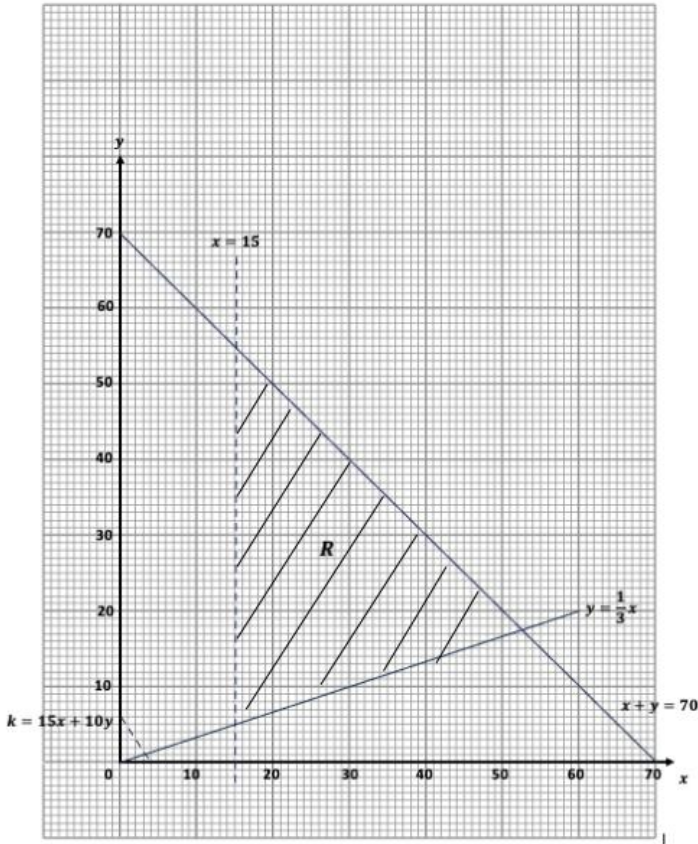


SOALAN 2 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 2(KERTAS 2)

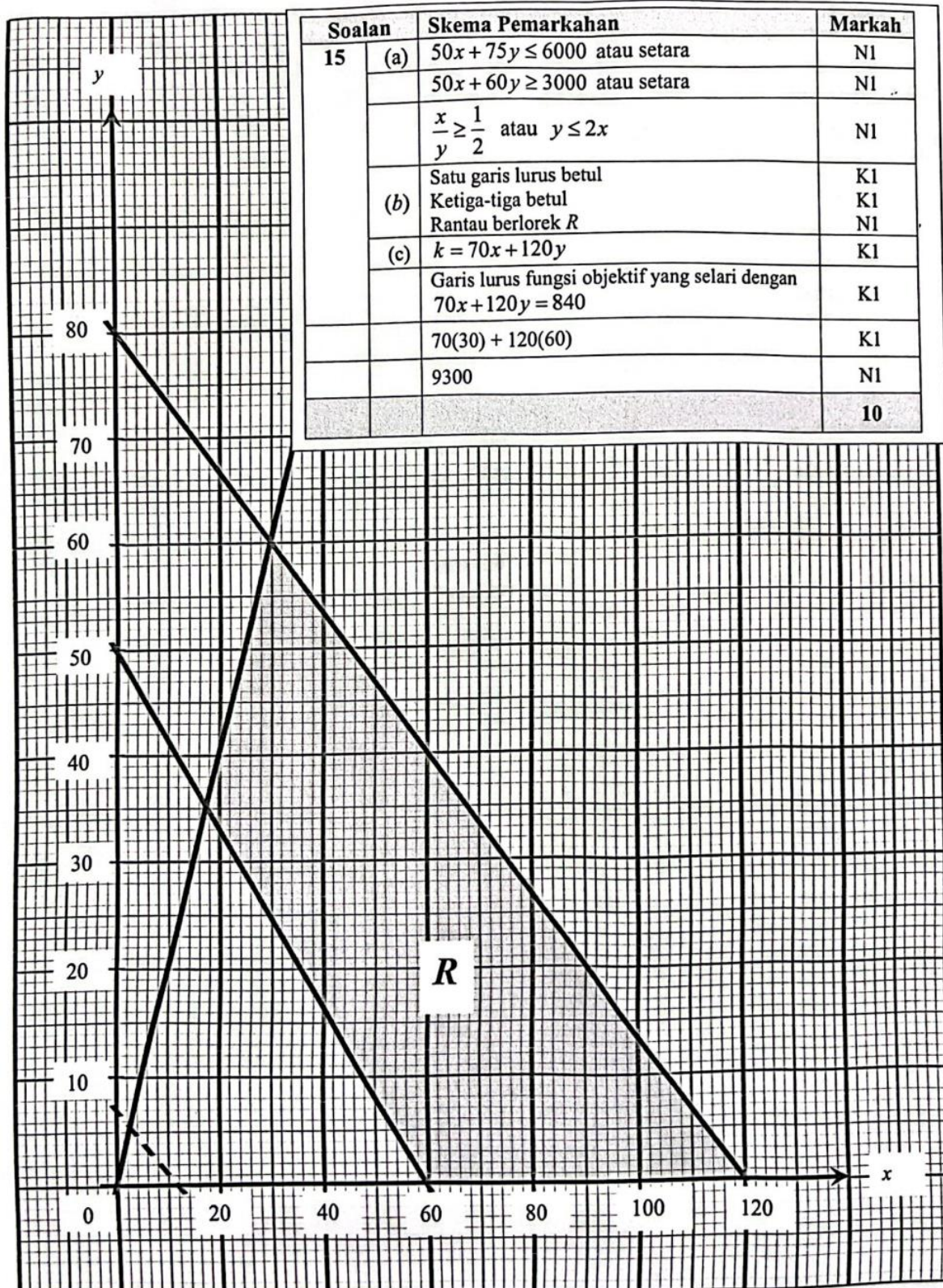
15	a	i.	$x \geq \frac{1}{3}y$ @ $y \leq 3x$	N1
		ii.	$3x + 2y \leq 1600$	N1
		iii.	$2x + y \geq 600$	N1
	b	• Lukis dengan betul sekurang-kurangnya satu garis lurus dari *ketaksamaan yang melibatkan x dan y pada paksi-paksi yang bermula dengan asalan.		K1
		• Lukis semua *garis lurus dengan betul dari semua *ketaksamaan yang melibatkan x dan y (terima garisan putus- putus dan garis padu).		N1
		• Rantau dilorek dengan betul.		N1
	c	i	120	N1
		ii	(300 , 350) @ Dilihat 350	N1
Max Profit = $10(300) + 5(350)$			K1	
= RM4750			N1	
				10

Soalan 15

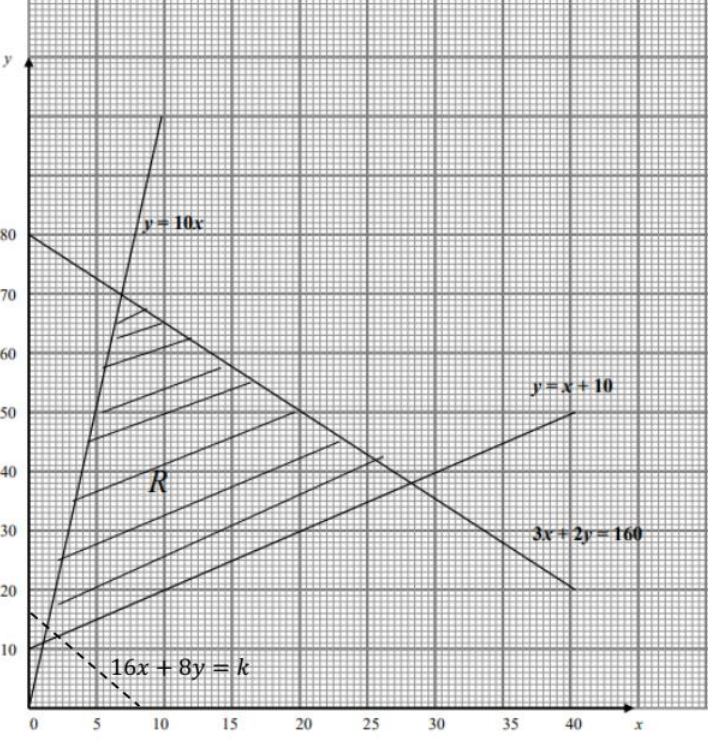


SOALAN 3 : SOALAN PERCUBAAN SPM SABAH (KERTAS 2)				
14	a)			
	$x + y \leq 70$	N1		
	$x > 15$	N1		
	$y \geq \frac{1}{3}x$	N1		
	b)			
	Lukis sekurang-kurangnya satu *garis lurus dengan betul	K1		
	Lukis dengan betul *semua garis lurus	N1		
	Rantau dilorek dengan betul	N1		
			10	
	c)			
	Tulis dan lukis fungsi objektif $k = 15x + 10y$	P1		
	Titik optimum (16,6)	N1		
	$k = 15(16) + 10(6)$	K1		
	$k = 300$			
	$1200 - 300 = 900$	N1		

SOALAN 4 : SOALAN PERCUBAAN SPM NEGERI SEMBILAN (KERTAS 2)

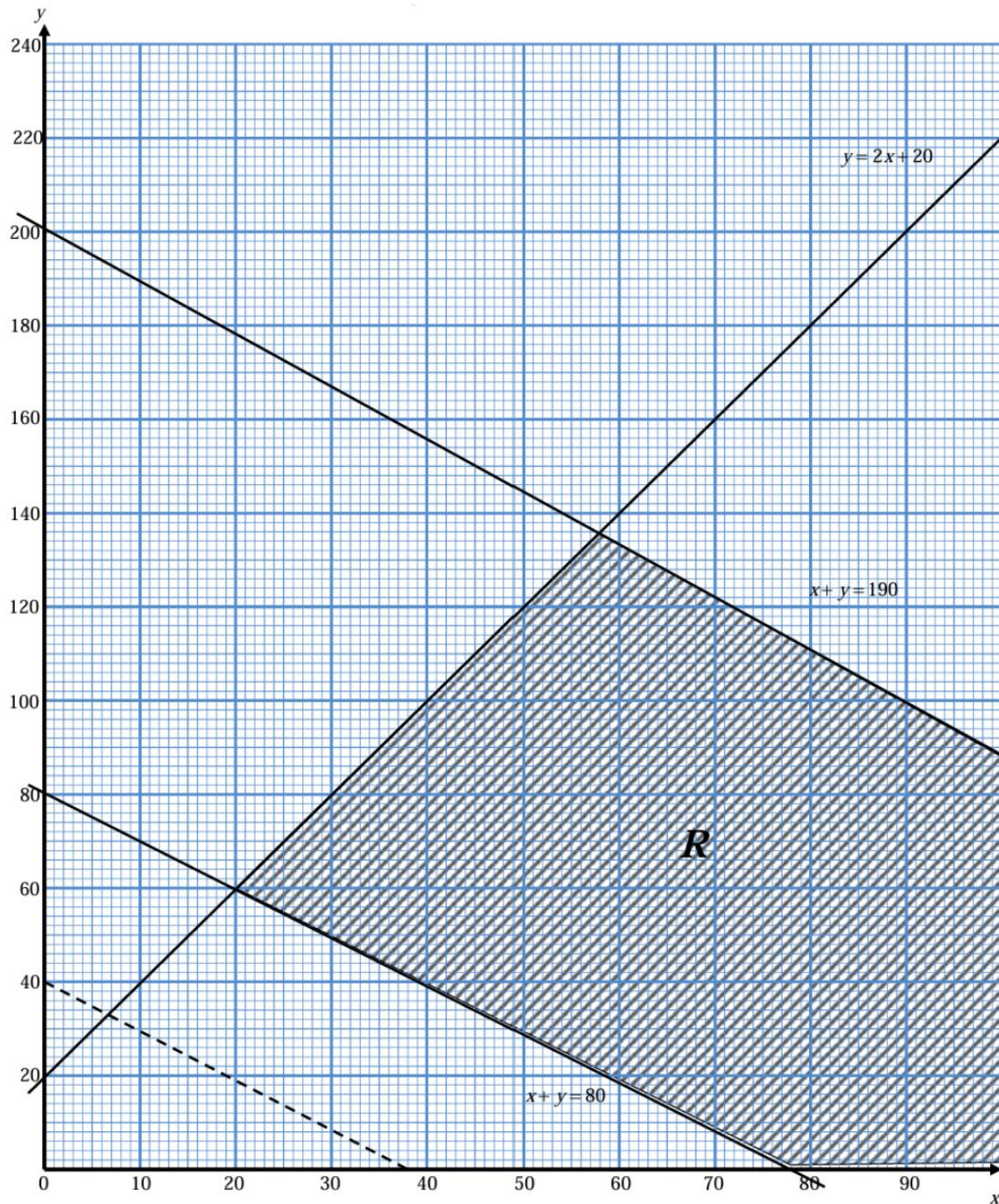


SOALAN 5: SOALAN PERCUBAAN SPM KELANTAN (KERTAS 2)

12	(a)	$3x + 6y \leq 160$ $y \geq x + 10$ $x \geq \frac{1}{10}y$	1 1 1		
	(b)		1 1 1		
	(c) (i)	76 orang	1		
	(ii)	Titik maksimum = (28, 37) dan garis fungsi objektif dilukis di graf. $k = 16(28) + 8(37)$ 744 *Garis fungsi objektif tidak dilukis di graf 0 markah	1 1 1	10	

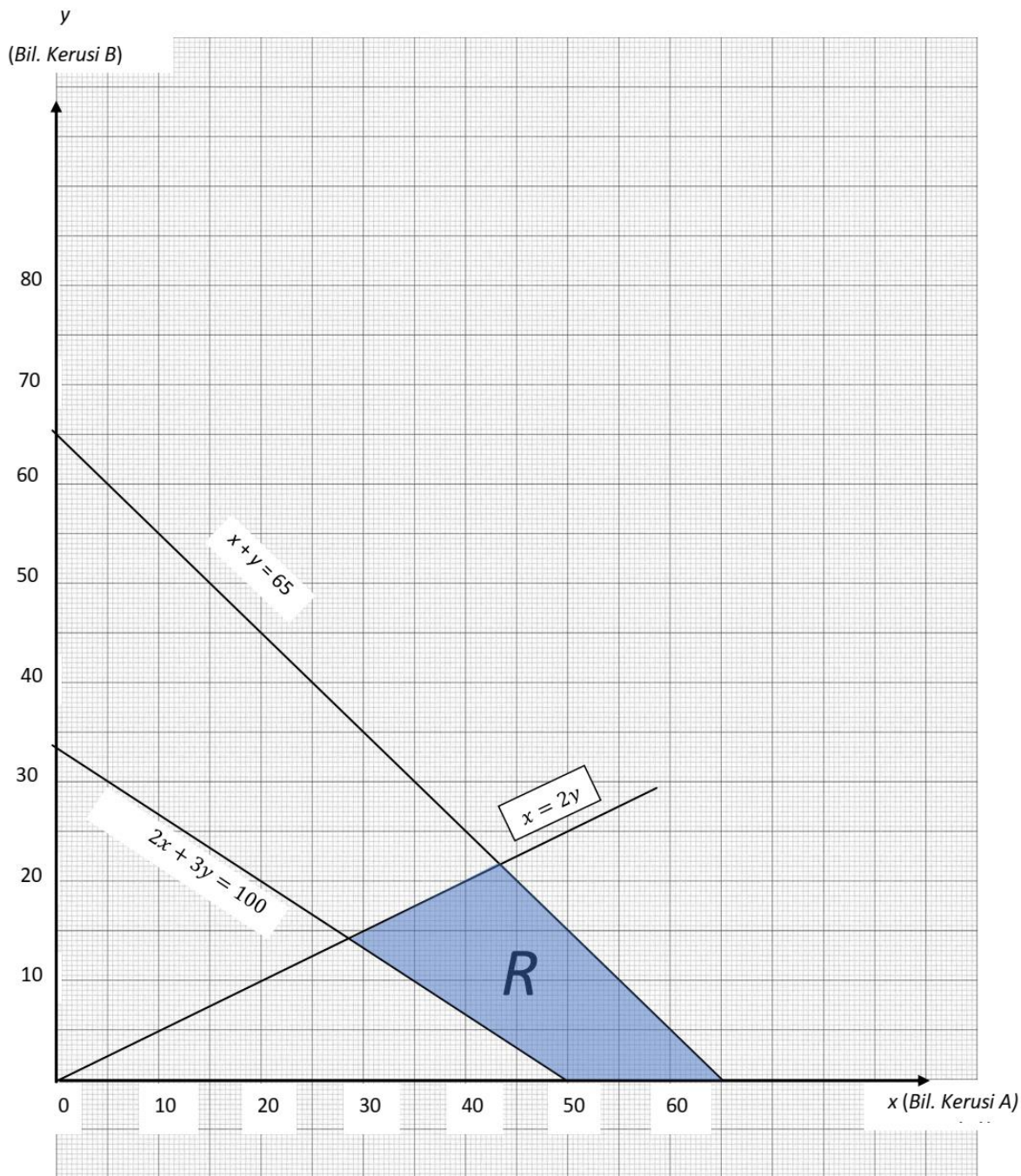
SOALAN 6: SOALAN PERCUBAAN SPM PAHANG SET 1(KERTAS 2)

15	(a)		$x + y \leq 190$	N1	
			$x + y \geq 80$	N1	
			$y - 2x \leq 20$	N1	
	(b)		Sekurang – kurangnya satu garis dilukis dengan betul mengikut ketaksamaan yang melibatkan x dan y	K1	
			3 garis ketaksamaan dilukis dengan betul	K1	
			Rantau dilorek dengan betul	N1	
	(c)	(i)	$50 \leq y \leq 80$	N1	
		(ii)	$400x + 380y = k$	K1	
			$400(20) + 380(60)$	K1	
			30800	N1	
					10

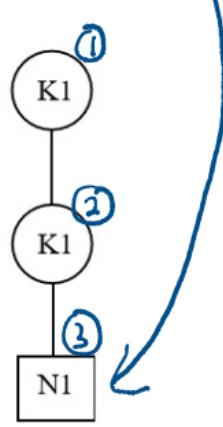
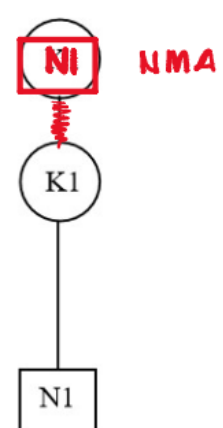


SOALAN 7: SOALAN PERCUBAAN SPM PERLIS (KERTAS 2)				
14	(a) $2x + 3y \geq 100$ $x + y \leq 65$ $x > 2y$	1m 1m 1m	3	
(b)	Lukis dengan betul sekurang-kurangnya satu garis lurus dari ketaksamaan yang melibatkan x dan y Lukis dengan betul semua garis lurus Rantau dilorek dengan betul	1m 1m 1m	3	
(c)	(i) (44,21) Ganti mana-mana titik di dalam rantau berlorek dalam persamaan $80x + 120y$	1m 1m		
(ii)	6,040 $35 \leq y \leq 55$	1m 1m	4	
				10

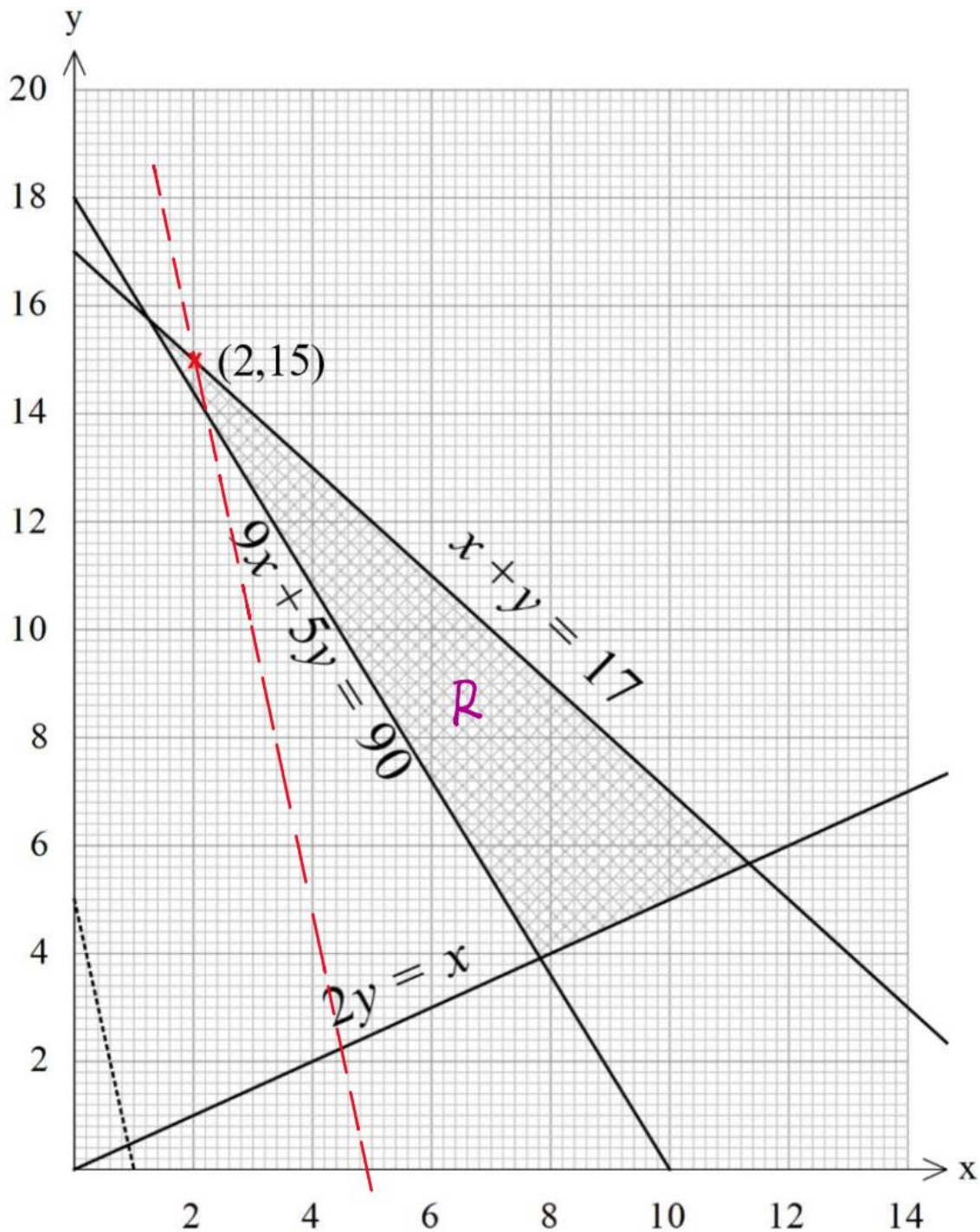
Graf soalan 14(b)



SOALAN 8: SOALAN PERCUBAAN SPM KEDAH (KERTAS 2)

14(a)	$9x + 5y \geq 90$ N1 $x + y \leq 17$ N1 $2y \geq x$ N1	3		
14(b)	Lukis dengan betul sekurang-kurangnya Satu garis lurus dari * ketaksamaan yang Melibatkan x dan y yang bermula dari asalan. Lukis dengan betul semua *garis lurus dari * ketaksamaan yang melibatkan x dan y Rantau dilorek dengan betul 	3		
14(c)(i)	$7 \leq x \leq 10$ N1	1		
14(c)(ii)	$50000x + 10000y = k$ Graf fungsi objektif dilukis $50000(2) + 10000(15)$ (RM)250 000 	3		
				10

Graf untuk soalan 14



MODUL TOPIKAL
SOALAN PERCUBAAN SPM 2024

TOPIK TINGKATAN 5
BAB 8

KINEMATIK GERAKAN LINEAR
(KINEMATICS OF LINEAR MOTION)

SUMBER SOALAN:
SOALAN – SOALAN PERCUBAAN SPM NEGERI
TAHUN 2024

SKEMA JAWAPAN

Modul Pintas Selangor Set 1
Modul Pintas Selangor Set 2
Sabah
Negeri Sembilan
Kelantan
Pahang Set 1
Perlis
Kedah

DISUSUN OLEH:
PN. NOORUL HUDA BINTI MOHD HASHIM
(SMK TAMAN TASIK, TAIPING)

PN ZAINAB BINTI ABD RAHMAN
(SMK CONVENT, TAIPING)

SOALAN 1 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 1(KERTAS 2)

12	a	(i)	$-t^2 + 5t + 6 > 0$ $0 < t < 6$	K1 N1	5
		(ii)	$-2t + 5 = 0$ $-\left(\frac{5}{2}\right)^2 + 5\left(\frac{5}{2}\right) + 6$ $\frac{49}{4}$	K1 K1 N1	
	b	$(t + 1)(t - 6) = 0$ $t = 6$ $s = -\frac{t^3}{3} + \frac{5t^2}{2} + 6t$ $-\frac{6^3}{3} + \frac{5(6)^2}{2} + 6(6)$ 54	K1 N1 K1 N1 N1	5	
					10

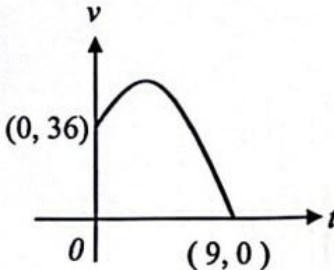
SOALAN 2 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 2 (KERTAS 2)

12	a	i	$t^2 - 6t - 7 < 0$ $0 < t < 7$	K1 N1	
		ii	$2t - 6 = 0$ $3^2 - 6(3) - 7$ -16	K1 K1 N1	
			b	$(t + 1)(t - 7) = 0$ $t = 7$ $s = \frac{t^3}{3} - \frac{6t^2}{2} - 7t$ $\frac{7^3}{3} - \frac{6(7)^2}{2} - 7(7)$ $81\frac{2}{3}$	K1 N1 K1 K1 N1
				10	

SOALAN 3 : SOALAN PERCUBAAN SPM SABAH (KERTAS 2)

15	(a) Beza v_A terhadap t $a = 2t - k$ Gantikan $t = 4$ dan $a = 3$ ke dalam $*a_A$ untuk mencari m $2(4) - k = 3$ 5	K1	
		K1	
		N1	
	(b) Guna $*v < 0$ DAN selesaikan *persamaan kuadratik $t^2 - *5t - 6 < 0$ dan $(t + 1)(t - 6) < 0$ $0 \leq t < 6$	K1	
		N1	
	(c) i) $\left \frac{(6)^3}{3} - (6)^2 - 20(6) - 10 \right @$ $\left \frac{(6)^3}{3} - (6)^2 - 20(6) \right + 10$ 94	K1	
		N1	
	ii) Kamirkan v_A terhadap t $s_A = \frac{t^3}{3} - \frac{5t^2}{2} - 6t$ Samakan s_A & s_B DAN Selesaikan *persamaan kuadratik $*\left(\frac{t^3}{3} - \frac{5t^2}{2} - 6t \right) = \frac{t^3}{3} - t^2 - 20t - 10 @$ $*\left(\frac{t^3}{3} - \frac{5t^2}{2} - 6t \right) + 10 = \frac{t^3}{3} - t^2 - 20t$ DAN $(3t + 2)(t - 10) = 0$ 10	K1	
		N1	
	Nota: $\int ar^n dr$ mesti betul sekurang ² nya dua sebutan dengan kuasa r bertambah 1 $\frac{d}{dr}(ar^n)$ mesti betul sekurang ² nya dua sebutan dengan kuasa r berkurang 1		

SOALAN 4 : SOALAN PERCUBAAN SPM NEGERI SEMBILAN (KERTAS 2)

13	(a) (i)	$a = 0$ dan $t = \frac{5}{2}$	P1
		$v_{maks} = \frac{-2t^2}{2} + 5t + c$ dan $-\left(\frac{5}{2}\right)^2 + 5\left(\frac{5}{2}\right) + 36$	K1
		42.25	N1
	(ii)	$t^2 - 5t - 36 = 0$	P1
		$(t+4)(t-9) = 0$	K1
		$k = 9$	N1
	(b)	 Bentuk graf (0,36) dan (9,0)	P1 P1
		$\left[-\frac{(9)^3}{3} + \frac{5(9)^2}{2} + 36(9)\right] - 0$	K1
		283.5	N1
			10

SOALAN 5: SOALAN PERCUBAAN SPM KELANTAN (KERTAS 2)

15	(a)	$25m + 5n = 0$ or $5m + n = 0$ $a = 2mt + n$ $2m + n = 3$ $m = -1$ $n = 5$	1 1 1 1 1	
	(b)	$-t^2 + 5t > 0$ atau $t^2 - 5t < 0$ $0 < t < 5$	1 1	
	(c)	$S = -\frac{t^3}{3} + \frac{5t^2}{2}$ Use $S_{t=5} - S_{t=4}$ 2.167	1 1 1	10

SOALAN 6: SOALAN PERCUBAAN SPM PAHANG SET 1 (KERTAS 2)

12	(a)		$a = -8 \text{ ms}^{-2}$	N1	
	(b)		$t = 4$	P1	
			Kamirkan a dan gantikan $t = 0$ dan $v = 12$ DAN Gantikan $t = 4$	K1	
			-4 ms^{-1}	N1	
	(c)		Gantikan $v = 0$ dan selesaikan persamaan kuadratik	K1	
			$t = 2$ dan $t = 6$	N1	
	(d)		Kamirkan $S_1 = \int_0^2 v \, dt$ atau $S_2 = \left \int_2^5 v \, dt \right $	K1	
			Gantikan pada titik 0,2 pada S_1 dan 2,5 pada S_2	K1	
			$S_1 + S_2 $	K1	
			$\frac{59}{3} // 19.67$	N1	
					10

SOALAN 7: SOALAN PERCUBAAN SPM PERLIS (KERTAS 2)				
12				
(a)	$a = 4 - 6t$ $a = 4 - 6(0)$ (1m)	2		
(b)	$4 - 6t = 0$ $t = \frac{2}{3}$ (1m) $4\left(\frac{2}{3}\right) - 3\left(\frac{2}{3}\right)^2 + 7$ (1m) $\frac{25}{3}$ (1m)	3		
(c)	$-3t^2 + 4t + 7 = 0$ $3t^2 - 4t - 7 = 0$ $(3t - 7)(t + 1) = 0$ (1m) $t = \frac{7}{3}$ (1m)	2		
(d)	$\int_0^2 (-3t^2 + 4t + 7) dt$ $\left[-\frac{3t^3}{3} + \frac{4t^2}{2} + 7t\right]_0^2$ (1m) $[-(2)^3 + 2(2)^2 + 7(2)] - [-(0)^3 + 2(0)^2 + 7(0)]$ (1m) 14 (1m)	3		
			10	

SOALAN 8: SOALAN PERCUBAAN SPM KEDAH (KERTAS 2)

15(a)	6 ms^{-1} N1	1		
15(b)	Bezakan V_p terhadap t $\frac{dV}{dt} = 5$ DAN Gantikan $t = \frac{1}{2}$ $2\left(\frac{1}{2}\right)t + 2$	2		
15(c)	Kamirkan $V_Q = \int a \, dt$ $V_Q = \frac{t^2}{2} + c$ Gantikan $t = 0, V_Q = 14$ untuk dapatkan nilai c Samakan $V_P = V_Q$ $\frac{1}{2}t^2 + 2t + 6 = \frac{1}{2}t^2 + 14$ Kamirkan $\int_0^8 V_Q \, dt$ dan gantikan nilai had $\int_0^8$	5		
15(d)	$\int_0^8 \left(\frac{t^2}{2} + 14\right) dt$ $197 \frac{1}{3} \text{ m @ } \frac{592}{3} \text{ m @ } 197.33 \text{ m}$	2		
			10	