

3472/2
Matematik
Tambahan
Kertas 2
2 ½ Jam



KEMENTERIAN PENDIDIKAN
JABATAN PENDIDIKAN NEGERI PERAK

SEKTOR PEMBELAJARAN NEGERI PERAK
JABATAN PENDIDIKAN NEGERI PERAK
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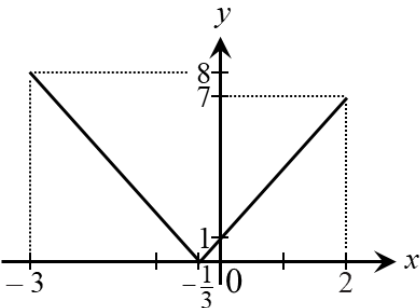
SKEMA JAWAPAN MODUL GEMPUR SPM
TAHUN 2022

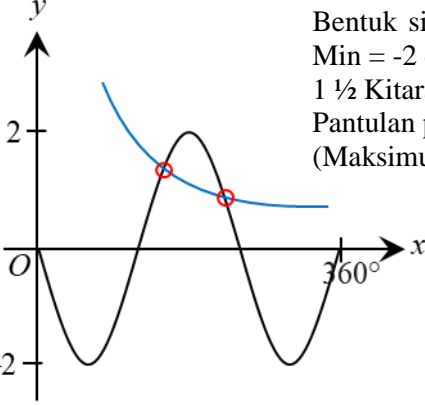
MATEMATIK TAMBAHAN
Kertas 2
Set 1
Dua Jam Tiga Puluh Minit

Bahagian A

SOALAN	BUTIRAN	MARKAH	JUMLAH
1(a)	$\vec{CB} + \vec{BA}$ atau $\vec{AB} + \vec{BC}$	1	3
	$\frac{n-3}{n}(-12\vec{x} + 20\vec{y}) = -3\vec{x} + 5\vec{y}$ dan perbandingan salah komponen dilakukan	1	
	4 (atau $n = 4$)	1	
(b)	$-12(3\vec{i}) + 20\left(\vec{i} - \frac{3}{5}\vec{j}\right)$	1	3
	$\frac{-16\vec{i} - 12\vec{j}}{\sqrt{(-16)^2 + (-12)^2}}$	1	
	$-\frac{4}{5}\vec{i} - \frac{3}{5}\vec{j}$	1	

SOALAN	BUTIRAN	MARKAH	JUMLAH
2(a)	$2! \times {}^n C_2$ ATAU $\frac{n!}{(n-2)!2!} = 45$	1	2
	90	1	
(b)(i)	${}^5 C_3 \times \frac{5!}{2!}$ atau ${}^6 P_3$	1	4
	1320	1	
	(ii)	$4 \times 3!$ atau $4 \times {}^4 P_3$ atau $4 \times 3 \times {}^3 P_2$ atau $4 \times 3 \times {}^4 P_2$ atau	
$4 \times 3 \times \frac{3!}{2!}$		1	
	372	1	

SOALAN	BUTIRAN	MARKAH	JUMLAH	
2(a)(i)	Domain = $\{-2, 1, 2, 4\}$	1	4	
	Julat = $\{2, 4, 6, 7\}$	1		
(ii)	Domain ialah $0 \leq x \leq 7$	1	4	
	Julat ialah $-4 \leq y \leq 2$	1		
(b)			2	
		- Bentuk V		1
		- Domain : $-3 \leq x \leq 2$; Julat : $0 \leq y \leq 8$; pintasan-y = 1 ; pintasan-x = $-\frac{1}{3}$		1

SOALAN	BUTIRAN	MARKAH	JUMLAH
4(a)	$\tan A = \frac{4}{3}$ $\frac{2\left(\frac{4}{3}\right)}{1-\left(\frac{4}{3}\right)^2}$ $-3\frac{3}{7}$	1 1 1	3
4(b)	 <p>Bentuk sinus Min = -2 dan Maks. = 2 1 ½ Kitaran untuk 2π Pantulan pada paksi-x (Maksimum 3 markah)</p> <p>$y = \frac{\pi}{x}$</p> <p>Lakar graf $y = \frac{\pi}{x}$</p> <p>Bilangan penyelesaian = 2</p>	1 1 1 1 1 1	6

SOALAN	BUTIRAN	MARKAH	JUMLAH
5(a)	$x + y + z = 10$(1) $2x + 6y + 3z = 34$(2) $z = 3y$(3)	1 1 1	3
5(b)	Hapus anu pertama dengan kaedah gantian atau penghapusan Hapus anu kedua dengan kaedah gantian atau penghapusan $x = 2 / y = 2 / z = 6$ $y = 2 / z = 6 / x = 2$ $z = 6 / y = 2 / x = 2$	1 1 1 1 1	5

SOALAN	BUTIRAN	MARKAH	JUMLAH
6 (a)	$3^{2x} \times 3^y = 3^{2x} + 16$ $(\sqrt{p})^2 \times \left(q^{\frac{1}{y}}\right)^y = (\sqrt{p})^2 + 16$ $p(q-1) = 16$ $p = \frac{16}{q-1}$	1 1 1 1	4
(b)	$\log_m a - \log_m 3 = 5 - \log_m (5-m)$ $\log_m \left(\frac{a}{3} \times (5-m)\right) = 5$ $a = \frac{3m^5}{5-m}$	1 1 1	3

SOALAN	BUTIRAN	MARKAH	JUMLAH
7(a)	$4jp = j\theta$ $\theta = 4p$	1 1	2
(b)	$s = \left(\frac{3}{2}j\right)(8p)$ $s = 12jp$	1 1	2
(c)	$p = \frac{\pi}{6}$ $\frac{1}{2}(j^2)(4p)$ atau $\frac{1}{2}\left(\frac{3}{2}j\right)^2(8p)$ $\frac{1}{2}(j^2)(4p) + \frac{1}{2}\left(\frac{3}{2}j\right)^2(8p)$ $\frac{11\pi}{6}j^2$	1 1 1 1	4

Bahagian B

SOALAN	BUTIRAN	MARKAH	JUMLAH
8(a)	$2y = 6 - (y^2 + 3)$ $y = 1, y = -2$ (<i>abaikan</i>) $(4, 1)$	1 1 1	3
(b)	$\frac{y^3}{3} + 3y$ $\frac{1}{2} \times 2 \times 4$ atau Guna \int_0^1 dalam $\frac{y^3}{3} + 3y$ $\frac{1}{2} \times 2 \times 4 + \int_0^1 y^2 + 3 dy$ $\frac{22}{3} // 7\frac{1}{3}$	1 1 1 1	4
(c)	$\pi \int_3^4 (x-3) dx$ $\pi \left[\frac{(4)^2}{2} - 3(4) \right] - \left[\frac{(3)^2}{2} - 3(3) \right]$ $\frac{1}{2} \pi$	1 1 1	3

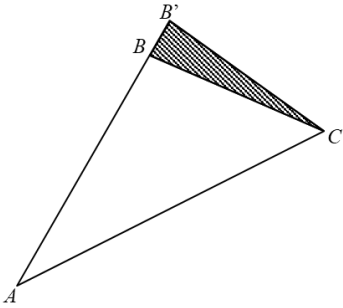
SOALAN	BUTIRAN	MARKAH	JUMLAH
9 (a)(i)	${}^8C_0 \left(\frac{3}{7}\right)^0 \left(\frac{4}{7}\right)^8$ atau ${}^8C_1 \left(\frac{3}{7}\right)^1 \left(\frac{4}{7}\right)^7$ $1 - {}^8C_0 \left(\frac{3}{7}\right)^0 \left(\frac{4}{7}\right)^8 - {}^8C_1 \left(\frac{3}{7}\right)^1 \left(\frac{4}{7}\right)^7$ 0.9204	1 1 1	3
(a)(ii)	$\sqrt[n]{n \left(\frac{3}{7}\right) \left(\frac{4}{7}\right)} = 11.5$ $n = 540$	1 1	2
(b)(i)	$\frac{40-40}{12}$ atau $\frac{60-40}{12}$ 0.4522	1 1	2
(b)(ii)	0.202 $\frac{m-40}{12} = -0.202$ $m = 37.58$	1 1 1	3

SOALAN	BUTIRAN	MARKAH	JUMLAH														
10 (a)	<table border="1"> <tr> <td>$\frac{1}{x^2}$</td> <td>0.62</td> <td>0.50</td> <td>0.32</td> <td>0.12</td> <td>0.06</td> <td>0.02</td> </tr> <tr> <td>$\frac{1}{y}$</td> <td>1.82</td> <td>1.49</td> <td>0.98</td> <td>0.40</td> <td>0.21</td> <td>0.12</td> </tr> </table> <p>Semua nilai betul</p>	$\frac{1}{x^2}$	0.62	0.50	0.32	0.12	0.06	0.02	$\frac{1}{y}$	1.82	1.49	0.98	0.40	0.21	0.12	1 1	2
$\frac{1}{x^2}$	0.62	0.50	0.32	0.12	0.06	0.02											
$\frac{1}{y}$	1.82	1.49	0.98	0.40	0.21	0.12											
(b)	Rujuk graf Paksi yang betul dan 1 titik diplot dengan betul Semua titik diplot dengan betul Graf garis lurus penyuaiian terbaik	1 1 1	3														
(c)(i)	$\frac{1}{y} = \frac{n}{m} \left(\frac{1}{x^2} \right) + \frac{1}{m}$ $\frac{1}{m} = 0.06 \quad \text{atau} \quad \frac{n}{m} = \frac{1.82 - 0.12}{0.62 - 0.02}$ $m = 16.67$ $n = 47.23$	1 1 1 1	5														
(ii)	$y = 0.84$	1															

SOALAN	BUTIRAN	MARKAH	JUMLAH
11 (a)(i)	$B(0, -5)$	1	
(ii)	$\frac{2(x) + 7(-3)}{9} = 0 \quad \text{atau} \quad \frac{2k + 7(-7)}{9} = -5$ $C\left(\frac{21}{2}, 2\right)$	1 1 1	3
(b)	$\frac{2}{3} \times m_N = -1$ $y - (-7) = -\frac{3}{2}(x - (-3))$ $2y = -3x - 23 \quad \text{atau setara}$	1 1 1	3
(c)	<p>Luas segitiga $AOB =$</p> $\frac{1}{2} \left[\begin{aligned} &((-3 \times 0) + (0 \times -5) + (0 \times -7)) \\ &-((-7 \times 0) + (0 \times 0) + (-5 \times -3)) \end{aligned} \right]$ <p>atau Luas segitiga $AOC =$</p> $\frac{1}{2} \left[\begin{aligned} &((-3 \times 0) + (0 \times 2) + \left(\frac{21}{2} \times -7\right)) \\ &-((-7 \times 0) + \left(0 \times \frac{21}{2}\right) + (2 \times -3)) \end{aligned} \right]$ <p>Luas $\Delta AOB = \frac{15}{2}$ dan Luas $\Delta AOC = \frac{135}{4}$</p> $\frac{15}{2} : \frac{135}{4}$ $2 : 9$	1 1 1 1	4

Bahagian C

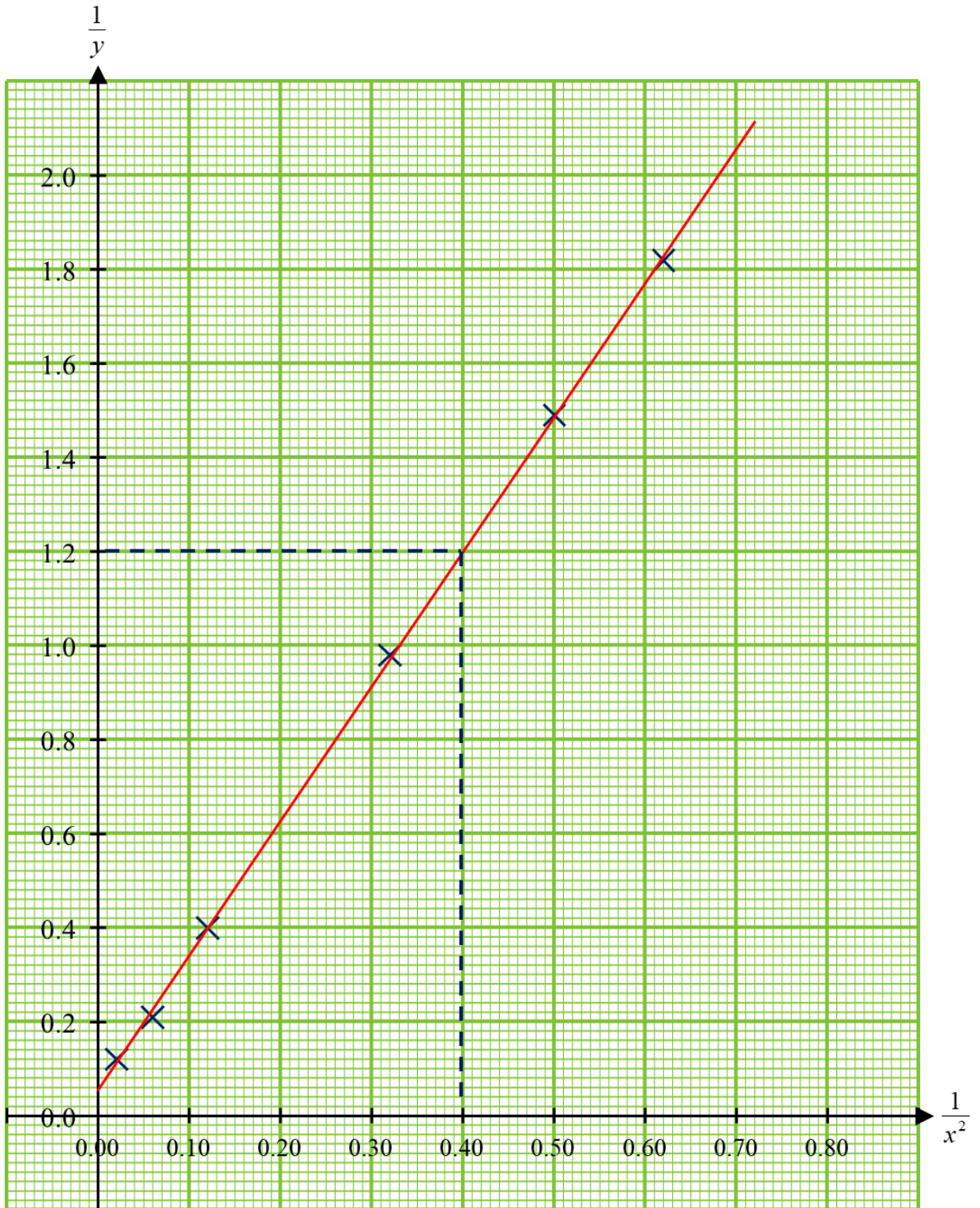
SOALAN	BUTIRAN	MARKAH	JUMLAH
12 (a)	I: $x + y \leq 450$ II: $x \leq 4y$ III: $18x + 16y \geq 3600$	1 1 1	3
(b)	Rujuk graf pada lampiran Mana-mana satu garisan dilukis dengan betul Kesemua 3 garisan dilukis dengan betul (garis padu atau garis putus-putus) Rantau R dilorek dengan betul	1 1 1	3
(c)(i)	340	1	4
(ii)	(360,90) $18(360) + 16(90)$ RM 7920	1 1 1	

SOALAN	BUTIRAN	MARKAH	JUMLAH
13 (a) (i)	$\frac{\sin E}{7} = \frac{\sin 50.5^\circ}{6.5}$ $\angle CED = 56.20^\circ$	1 1	2
(ii)	$AB^2 = 5^2 + 9^2 - 2(5)(9) \cos 50.5^\circ$ $AB = 6.98\text{cm}$	1 1	2
(iii)	$\frac{CE}{\sin 73.30^\circ} = \frac{6.5}{\sin 50.5^\circ}$ atau $7^2 + 6.5^2 - 2(7)(6.5)\cos 73.30^\circ$ $CE = 8.068 \text{ cm}$ $\frac{1}{2} (8.068 + 9) (6.5) \sin 56.20^\circ$ 46.10 cm^2	1 1 1 1	4
13 (b)	 <p>C. $\angle AB'C > \angle ACB'$</p>	1 1	2

SOALAN	BUTIRAN	MARKAH	JUMLAH
14 (a)	$2(0)^2 - 8$ -8 m s^{-2}	1 1	2
14 (b)	$t^2 - 8t + 12 > 0$ $(t - 6)(t - 2) > 0$ $0 \leq t < 2 // t < 2, t > 6$	1 1	2
14 (c)	$2t - 8 < 0$ $0 < t < 4 // t < 4$	1 1	2
14 (d)	$s = \frac{t^3}{3} - \frac{8t^2}{2} + 12t + c$ $\frac{(1)^3}{3} - \frac{8(1)^2}{2} + 12(1) / \frac{(2)^3}{3} - \frac{8(2)^2}{2} + 12(2)$ $\left \frac{32}{3} - \frac{25}{3} \right $ $\frac{7}{3} \text{ m}$	1 1 1 1	4

SOALAN	BUTIRAN	MARKAH	JUMLAH
15(a)	$150 = \frac{9}{3p - q} \times 100$ atau $125 = \frac{11}{p + q} \times 100$ Kaedah penyelesaian $3p - q = 6$ dan $p + q = 8.8$ (Hapuskan satu anu) $p = 3.7$ $q = 5.1$	1 1 1 1	4
(b)	$\frac{(120 \times 4) + (150 \times 2) + (125 \times 4)}{4 + 2 + 4}$ $\bar{I} = 128$ 28%	1 1 1	3
(d)	$128 \times \frac{115}{100}$ $128 \times \frac{115}{100} = \frac{P_{23}}{25} \times 100$ RM 36.80	1 1 1	3

Soalan 10 (b)



Soalan 12 (b)

