

SULIT  
3472/2  
Matematik Tambahan  
2022

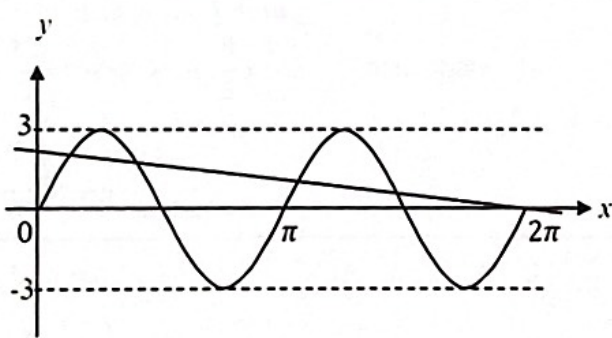


**MAJLIS PENGETUA SEKOLAH MENENGAH MALAYSIA  
CAWANGAN NEGERI SEMBILAN DARUL KHUSUS**

**PROGRAM PENINGKATAN AKADEMIK TINGKATAN 5  
SEKOLAH-SEKOLAH MENENGAH NEGERI SEMBILAN 2022**

**PERATURAN PERMARKAHAN  
MATEMATIK TAMBAHAN KERTAS 2**

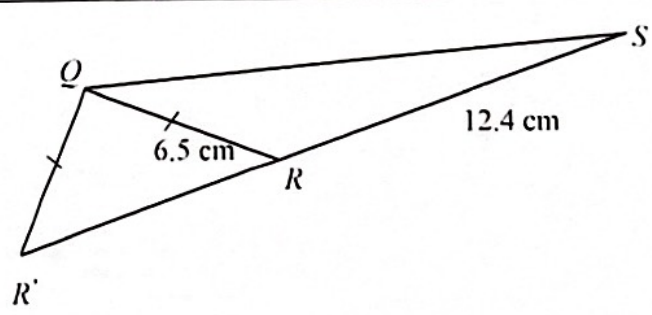
NO	PERATURAN PEMARKAHAN	MARKAH
1	$y = \frac{1-2x}{3} \qquad \text{ATAU} \qquad x = \frac{1-3y}{2}$ $x^2 + 9x\left(\frac{1-2x}{3}\right) = -8 \qquad \left(\frac{1-3y}{2}\right)^2 + 9\left(\frac{1-3y}{2}\right)y = -8$ $(5x - 8)(x + 1) = 0 \qquad (15y + 11)(y - 1) = 0$ $x = \frac{8}{5} \text{ dan } x = -1 \qquad y = -\frac{11}{15} \text{ dan } y = 1$ $y = -\frac{11}{15} \text{ dan } y = 1 \qquad x = \frac{8}{5} \text{ dan } x = -1$	PI KI KI NI NI
		5 markah
2	<p>(a) <math>k(x) = \sqrt{x-3}</math></p> <p>(b) <math>(\sqrt{x-3})^2 + 3</math> atau <math>\sqrt{(x^2+3)-3}</math>  <math>hk(x) = x</math> atau <math>kh(x) = x</math>  <math>hk(x) = kh(x)</math></p> <p>(c) <math>B\left(\frac{13}{4}, \frac{1}{2}\right)</math>  <math>\sqrt{\left(\frac{13}{4} - \frac{1}{2}\right)^2 + \left(\frac{1}{2} - \frac{13}{4}\right)^2}</math>  <math>\frac{11\sqrt{2}}{4}</math> atau 3.889</p>	NI KI KI NI PI KI NI
		7 markah
3	<p>(a) <math>\frac{1}{2}(4\sqrt{5x})(5\sqrt{5y}) - (2\sqrt{x})(3\sqrt{y})</math>  <math>\frac{1}{2}(100)\sqrt{xy} - 6\sqrt{xy}</math> atau <math>44\sqrt{xy}</math>  <math>k = 44</math></p> <p>(b) <math>(2^t)^2(2)</math>  <math>(2^t - 8)(2(2^t) + 15) = 0</math> atau setara  <math>2^t = 8</math> or <math>2^t = 2^3</math>  <math>t = 3</math></p>	KI KI NI KI KI KI NI
		7 markah

4	(a)	$-\frac{1}{150}x^2 + \frac{2}{5}x = 0$ $x\left(-\frac{1}{150}x + \frac{2}{5}\right) = 0$ <p>60 atau (60, 0)</p>	K1
			K1
			N1
5	(b)	<u>Gantikan koordinat :</u> $-\frac{1}{92}p^2 + q = 0 \quad \text{atau} \quad -\frac{1}{92}(46 + p)^2 + q = 3$ <u>Tukar perkara rumus :</u> $q = \frac{1}{92}p^2 \quad \text{atau setara}$ <u>Gantikan dalam persamaan kedua :</u> $-\frac{1}{92}(46 + p)^2 + \frac{1}{92}p^2 = 3 \quad \text{atau setara}$ <u>Selesaikan p atau q : (p = -26)</u> Tinggi maksimum = 7.348 atau $\frac{169}{23}$	K1
			K1
			K1
			K1
			N1
			8 markah
	(a)	$\frac{\sin x}{\cos x}(1 + 2\cos^2 x - 1)$ $\sin 2x$	K1
			N1
(b)			
(i)	 <p>Bentuk sin            Amplitud (maksimum = 3 dan minimum = -3)            2 kitaran</p>	P1	
		P1	
		P1	
(ii)	$y = 2 - \frac{x}{\pi}$ <p>Graf garis lurus <math>y = 2 - \frac{x}{\pi}</math></p> <p>5 bilangan penyelesaian</p>	K1	
		K1	
		N1	
		8 markah	

6	(a)	$\int_0^2 6x - x^2 - 2x^2 dx \text{ atau } \left[ \frac{6x^2}{2} - \frac{3x^3}{3} \right]_0^2$ $\left[ \frac{6(2)^2}{2} - \frac{3(2)^3}{3} \right] - 0$	KI									
		4	NI									
	(b)	$\int_0^2 \pi(2x^2)^2 dx \text{ atau } \pi \left[ \frac{4x^5}{5} \right]_0^2$ $\pi \left( \frac{4(2)^5}{5} - \frac{4(0)^5}{5} \right)$ $\frac{128}{5} \pi$	KI									
			NI									
			6 markah									
7	(a)	$\overline{PB} = \overline{PO} + \overline{OB}$ atau $\overline{PB} = \overline{PA} + \overline{AB}$ atau $\overline{OQ} = \overline{OA} + \overline{AQ}$ atau setara	KI									
	(i)	$\overline{PB} = -6\underline{x} + 4\underline{y}$	NI									
	(ii)	$\overline{OQ} = \frac{9}{2}\underline{x} + 2\underline{y}$	NI									
	(b)	$\overline{PR} = -\frac{12}{5}\underline{x} + \frac{8}{5}\underline{y}$ atau setara - Bandingkan pekali $\underline{x}$ atau $\underline{y}$ : $-\frac{12}{5} = -6\lambda$ atau $\frac{8}{5} = 4\lambda$ atau setara $\lambda = \frac{2}{5}$ atau setara $\overline{PR} = \frac{2}{5}\overline{PB}$ atau setara	KI									
			NI									
	(c)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 33%;"><math>\frac{1}{2} 3\underline{x} h = 12</math></td> <td style="width: 33%;"><math>\frac{1}{2}(3PA)h</math></td> <td style="width: 33%;"><math>\frac{OAB}{PAB} = \frac{3}{1}</math></td> </tr> <tr> <td><math>\frac{1}{2} 9\underline{x}  \left( \frac{8}{ \underline{x} } \right)</math></td> <td><math>3 \times 12</math></td> <td><math>OAB = 3(12)</math></td> </tr> <tr> <td>36</td> <td>36</td> <td>36</td> </tr> </tbody> </table>	$\frac{1}{2} 3\underline{x} h = 12$	$\frac{1}{2}(3PA)h$	$\frac{OAB}{PAB} = \frac{3}{1}$	$\frac{1}{2} 9\underline{x}  \left( \frac{8}{ \underline{x} } \right)$	$3 \times 12$	$OAB = 3(12)$	36	36	36	KI
	$\frac{1}{2} 3\underline{x} h = 12$	$\frac{1}{2}(3PA)h$	$\frac{OAB}{PAB} = \frac{3}{1}$									
$\frac{1}{2} 9\underline{x}  \left( \frac{8}{ \underline{x} } \right)$	$3 \times 12$	$OAB = 3(12)$										
36	36	36										
			NI									
			9 markah									
8	(a)	$r^2 + (h - 10)^2 = 10^2$ atau $r = \sqrt{10^2 - (h - 10)^2}$ $A = \pi(10^2 - (h - 10)^2)$ atau $A = \pi(\sqrt{10^2 - (h - 10)^2})^2$ $A = \pi(20h - h^2)$	KI									
			NI									
	(b)	$\frac{dA}{dh} = 20\pi - 2\pi h$ $20\pi - 2\pi(12)$ $\frac{dA}{dt} = (20\pi - 2\pi(12)) \times 0.5$ $-2\pi$	KI									
			NI									

	(c) $\delta h = \frac{p}{100} \times 12$ atau $p = \frac{\delta h}{12} \times 100$ atau setara $\delta A = (20\pi - 2\pi(12)) \times \frac{3}{25} p$ $-\frac{12p}{25} \pi$	K1 K1 N1
		10 markah
9	(a) Lihat lampiran m/s 9	5 m
	(b) $\log_{10} y = \log_{10} h + (k - 2) \log_{10} x$ (i) $k - 2 = \frac{1.65 - 0.63}{1.20 - 0.32} = 1.159$ (terima $1.147 \leq m \leq 1.20$ ) atau $\log_{10} h = 0.26$ $k = 3.159$ (ii) $h = 1.820$ (iii) $x = 2.951$	P1 K1 N1 N1 N1
		10 markah
10	(a) (i) ${}^{10}C_2 \left(\frac{3}{5}\right)^2 \left(\frac{2}{5}\right)^8$ atau ${}^{10}C_1 \left(\frac{3}{5}\right)^1 \left(\frac{2}{5}\right)^9$ atau ${}^{10}C_0 \left(\frac{3}{5}\right)^0 \left(\frac{2}{5}\right)^{10}$ $1 - \left[ {}^{10}C_2 \left(\frac{3}{5}\right)^2 \left(\frac{2}{5}\right)^8 + {}^{10}C_1 \left(\frac{3}{5}\right)^1 \left(\frac{2}{5}\right)^9 + {}^{10}C_0 \left(\frac{3}{5}\right)^0 \left(\frac{2}{5}\right)^{10} \right]$ 0.9877 (ii) $0.6 \times 0.4 \times n = 300$ 1250	K1 K1 N1 K1 N1
	(b) (i) $\frac{30 - 48}{6.5}$ atau $\frac{50 - 48}{6.5}$ 0.6181 // 0.6180 (ii) $P(X > h) = 0.08$ atau $z = 1.406$ // 1.405 $\frac{h - 48}{6.5} = 1.406$ // 1.405 57.14 // 57.13	K1 N1 K1 K1 N1
		10 markah

11	(a)		
	(i)	$\sqrt{(-10 - 2h)^2 + (10 + 3h)^2} = \sqrt{113}$ $(h + 1)(13h + 87) = 0$ $h = -1$ $m_{SD} = \frac{3 - (-2)}{-2 - (-8)}$ $k = 8$	KI KI NI KI NI
	(ii)	$m_{CS} = \frac{10 - 3}{-10 - (-2)}$ $-\frac{7}{8} \times -\frac{6}{5} \neq -1$ <p>CS bukan laluan terpendek.</p>	KI KI NI
	(b)	$\frac{1(-8) + 2\left(\frac{1}{2}\right)}{3} \text{ atau } \frac{1(-2) + 2(-4)}{3}$ $E\left(-\frac{7}{3}, -\frac{10}{3}\right)$	KI NI
			10 markah
12	(a)	$a_Q = -2$ atau $a_P = 4t - 11$ Zarah Q kerana $a_Q = -2$	KI NI
	(b)	$(2t - 3)(t - 4) < 0$ dan $-2t + 6 < 0$ $3 < t < 4$	KI NI
	(c)	$s_P = \frac{2}{3}t^3 - \frac{11}{2}t^2 + 12t + c$ <p>apabila <math>t = 0</math>, <math>s_P = -6</math></p> $s_P = \frac{2}{3}(3)^3 - \frac{11}{2}(3)^2 + 12(3) - 6$ $-\frac{3}{2}$	PI KI KI NI
	(d)	$2 \left[ \frac{1}{2}(3)(6) \right]$ atau setara 18	KI NI
			10 markah

13	(a)	$x = 13$ $y = 150$ $z = 4.80$ (tidak terima 4.8)	N1 N1 N1
	(b)	$\frac{x}{62.50} \times 100 = 134$	K1
	(i)	$x = 83.75$	N1
	(ii)	$\frac{104(2) + 150(5) + 150(1) + 125w}{2 + 5 + 1 + w}$ $\frac{104(2) + 150(5) + 150(1) + 125w}{2 + 5 + 1 + w} = 134$ dan selesaikan $w$ $w = 4$	K1 K1 N1
	(iii)	$\frac{x}{62.50} \times 100 = 124$ $x = 77.50$ (tidak terima 77.5)	K1 N1
			10 markah
14	(a)	$QPS = 65^\circ$	P1
	(i)	$\frac{QS}{\sin 65^\circ} = \frac{9.2}{\sin 35^\circ}$ $QS = 14.54 \text{ cm}$ or $14.537 \text{ cm}$	K1 N1
	(ii)	$14.54^2 = 6.5^2 + 12.4^2 - 2(6.5)(12.4)\cos QRS$ $\angle QRS = 95.48^\circ$	K1 N1
	(iii)	$\frac{1}{2}(6.5)(12.4)\sin 95.48^\circ$ atau $\frac{1}{2}(9.2)(14.54)\sin 80^\circ$	K1
		$\frac{1}{2}(6.5)(12.4)\sin 95.48^\circ + \frac{1}{2}(9.2)(14.54)\sin 80^\circ$ 105.98	K1 N1
	(b)		
(i)		P1	
(ii)	$QR'S = 84.52^\circ$	N1	
			10 markah

15	(a)	$y - x \leq 40$	NI
		$1000x + 500y \leq 50\,000$ atau setara	NI
	(b)	Bilangan mesin cetak P adalah tidak lebih daripada 3 kali bilangan mesin cetak Q. ATAU setara. <i>The number of printer P is not more than 3 times the number of printer Q. OR equivalent.</i>	NI
	(c)	Lihat lampiran m/s 10. Dua garis lurus dilukis betul. Rantau R betul.	NINI NI
	(d)(i)	$10 \leq y \leq 40$	NI
	(ii)	Titik maksimum (20, 60)  Keuntungan maksimum = $200(20) + 150(60)$  13 000	NI  KI  NI
			10 markah



$\log_{10} x$	0.10	0.32	0.70	0.80	1.00	1.20	N1
$\log_{10} y$	0.40	0.63	1.00	1.22	1.41	1.65	N1

$\log y$

Graf garis lurus  $\log y$  melawan  $\log x$  dilukis. paksi-paksi betul dan skala seragam, sekurang-kurangnya satu \*titik diplot betul  
 6 \*titik diplot betul  
 Garis lurus penyuaiian terbaik sekurang-kurangnya 5 \*titik

K1  
 N1  
 N1

