Matematik Tambahan **3472/2**
SEPTEMBER 2024

MAJLIS PENGETUA SEKOLAH MALAYSIA (MPSM)
CAWANGAN KELANTAN

MODUL KOLEKSI ITEM
PERCUBAAN SPM
2024

MATEMATIK TAMBAHAN
KERTAS 2

UNTUK KEGUNAAN PEMERIKSA SAHAJA

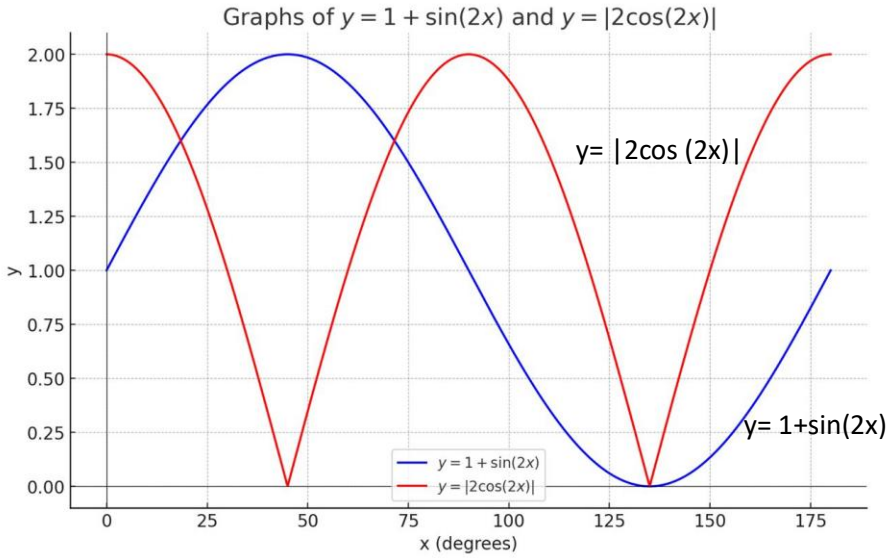
SKEMA PEMARKAHAN

PERATURAN PEMARKAHAN PEPERIKSAAN PERCUBAAN SPM TAHUN 2024
MATEMATIK TAMBAHAN
TINGKATAN 5
KERTAS 2

NO.			PERATURAN PEMARKAHAN	SUB-MARKAH	MARKAH PENUH
1	(a)		$f^2(x) = 9x + 8$	1	
			Katakan $f(x) = ax + b \quad , f^2(x) = a^2x + ab + b$ atau setara		
			Banding , $a^2 = 9$, $ab + b = 8$	1	
			$f(x) = 3x + 2$ dan $f(x) = -3x - 4$	1	
			Fungsi memenuhi syarat, $f(1) = -7$. $f(x) = -3x - 4$	1	
	(b)	(i)	$\frac{y+1}{3}$ *atau* $g(x) = \frac{5\left(\frac{y+1}{3}\right)}{3} + 7$	1	
			$g(x) = \frac{5x + 26}{3}$	1	
		(ii)	$\frac{5(p+1)+26}{3} = 2q - 3$	1	8
			$p = \frac{6q - 40}{5}$	1	
2	(a)		$PA = QA$ *and* $PB = QB$ $PAQB$ *is a Rombus* $\angle APB = \angle AQB$	1	
			$2\theta + \theta = 2\pi$ (sudut di pusat adalah 2 kali sudut di lilitan)	1	
			$\theta = \frac{2}{3}\pi$	1	

	(b)		Luas tembereng *AQB* $\frac{1}{2}j^2(\frac{2}{3}\pi)-\frac{1}{2}j^2\sin(\frac{2}{3}\pi@120°)$ $(\frac{\pi}{3}-\frac{\sqrt{3}}{4})j^2\ cm^2$ *Luas rantau berlorek* $\pi j^2-2(\frac{\pi}{3}-\frac{\sqrt{3}}{4})j^2$ $\left(\frac{1}{3}\pi+\frac{\sqrt{3}}{2}\right)j^2\ cm^2$	1 1 1 1	7
3	(a)		$10N=0.454545...$ *or* $1000N=45.4545...$ $N=\frac{1}{22}$ *and* $m-n=-21$	1 1	
	(b)		*seen* $\frac{\sqrt{3}}{2}$ $\frac{1}{2}\times 4j^2\times\frac{\sqrt{3}}{2}-3\left(\frac{j^2\pi}{6}\right)=12\sqrt{3}-6\pi$ $j^2=\frac{12\sqrt{3}-6\pi}{\sqrt{3}-\frac{\pi}{2}}\times\frac{\sqrt{3}+\frac{\pi}{2}}{\sqrt{3}+\frac{\pi}{2}}$ $\frac{36-3\pi^2}{3-\frac{\pi^2}{4}}$ *or* $\frac{12(3-\pi^2/4)}{3-\frac{\pi^2}{4}}$ $j=2\sqrt{3}$	1 1 1 1 1	7
4	(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
5	(a)		$\sqrt{(x-(-3)^2 + (y-2)^2}$ atau $\sqrt{(-6-(-3)^2 + (-2-2)^2}$ $\sqrt{(x-(-3)^2 + (y-2)^2} = \sqrt{(-6-(-3)^2 + (-2-2)^2}$ $x^2 + y^2 + 6x - 4y - 12 = 0$	1 1 1	
	(b)		$\frac{2(-3) + 1(x)}{1+2} = -6$ atau $\frac{2(2) + 1(y)}{1+2} = -2$ $(-12, -10)$	1 1	
	(c)		$\frac{1}{2}\left\|\left((0)(2) + (-3)(-2) + (-6)(0)\right) - \left((0)(-3) + (2)(-6) + (-2)(0)\right)\right\|$ 9	1 1	7
6	(a)		$2x + 2r + \pi r = 80$ $2r\left(\frac{80 - 2r - \pi r}{2}\right)$ $A = 80r - 2r^2 - \frac{1}{2}\pi r^2$	1 1 1	
	(b)		$\frac{dA}{dr} = 80 - 4r - \pi r$ dan samakan dengan 0 $r = 11.20$ $A = 80(11.20) - 2(11.20)^2 - \frac{1}{2}\pi(11.20)^2$ 448.05	1 1 1 1	7

7	(a)			1 1 1 1 1	
	(b)	(i)	3	1	
		(ii)	$\begin{pmatrix}0\\1\end{pmatrix}$	1	7
8	(a)		$4k + 2m = 11$ atau $\left[\frac{kx^{2+1}}{2+1} + 2mx\right]_0^2 = \frac{34}{3}$ Selesaikan persamaan $4k + 2m = 11$ dan $4k + 6m = 17$ $k = 2$ $m = \frac{3}{2}$	1 1 1 1	
	(b)		$m_1 = 8$ dan $(8)(m_2) = -1$ $m_2 = -\frac{1}{8}$ $y - 11 = -\frac{1}{8}(x - 2)$ atau setara $x + 8y = 90$ atau setara	1 1 1	
	(c)		$\pi\left[\frac{y^{1+1}}{2(1+1)} - \frac{3}{2}y\right]_3^6$ $atau$ $\pi\left[\frac{y^2}{2(2)} - \frac{3}{2}y\right]_3^6$ $\pi\left(\left[\frac{(6)^2}{4} - \frac{3}{2}(6)\right] - \left[\frac{(3)^2}{4} - \frac{3}{2}(3)\right]\right)$ $\frac{9}{2}\pi$	1 1 1	10

9	(a)	(i)	$\overrightarrow{PM} = \overrightarrow{PN} + \overrightarrow{NM}$ atau $\overrightarrow{OM} = \overrightarrow{ON} + \overrightarrow{NM}$	1	
		(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	10
10	(a)				

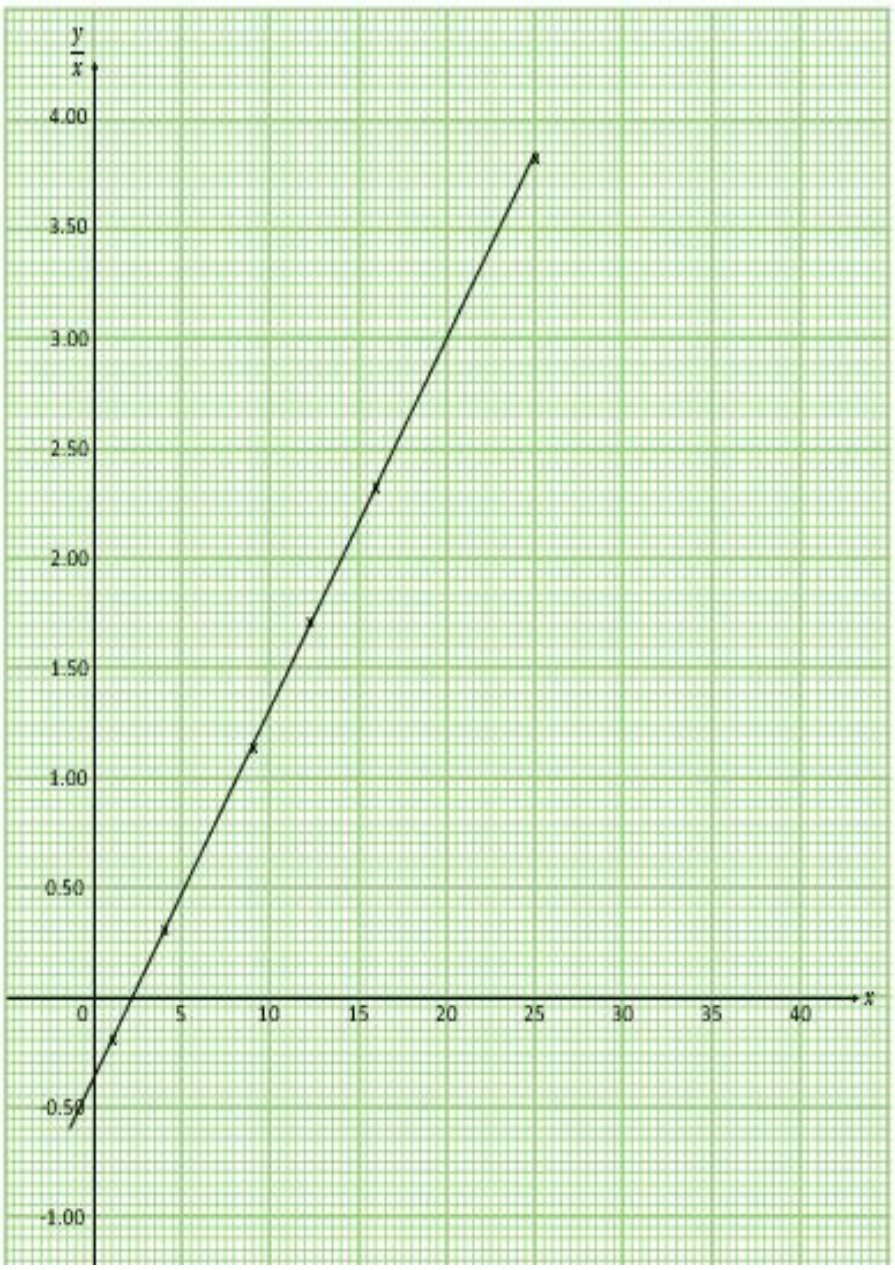
x					4.00	
y		0.68				
x^2				12.25		
$\frac{y}{x}$	-0.17		1.17		2.33	

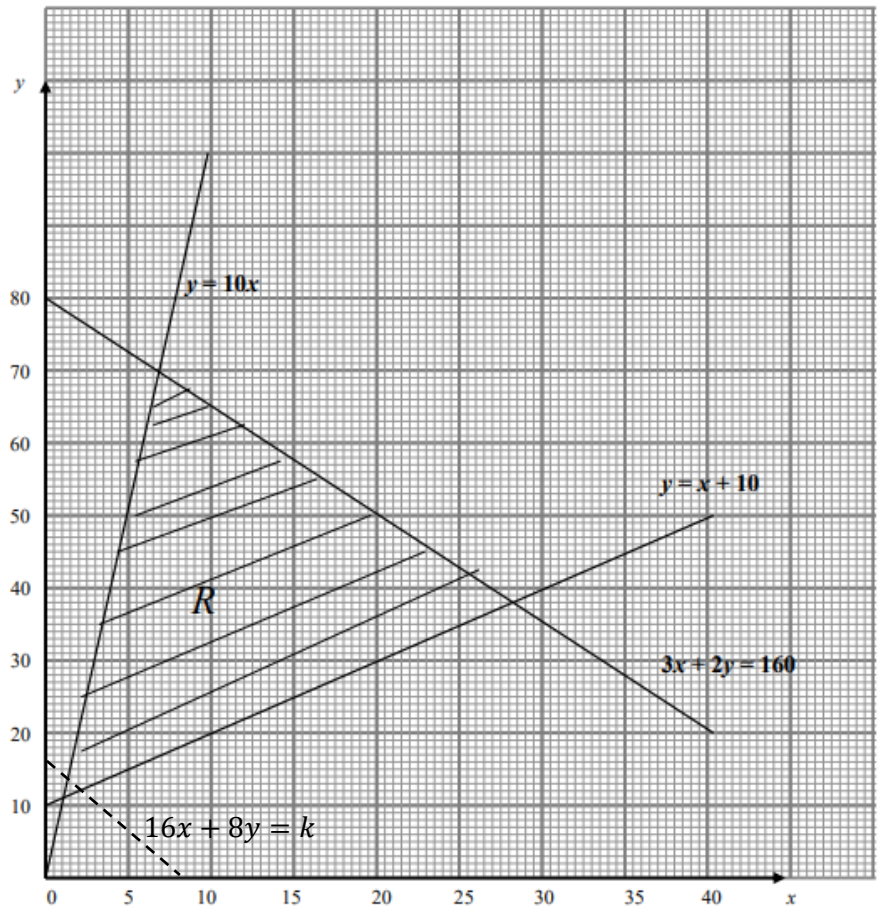
1

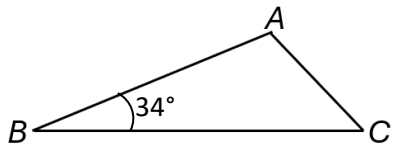
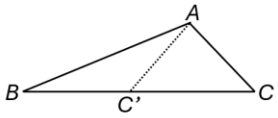
- *Betul sekurang-kurangnya 3 , 1 markah*

Betul semua 2 markah 1

	(b)		Rujuk graf	1	
			Graf garis lurus $\frac{y}{x}$ melawan x dilukis - Paksi-paksi betul dan skala seragam - Sekurang-kurang satu* titik diplot betul - Guna data yang diberi dalam soalan		
			6* titik diplot dengan betul	1	
			Garis lurus penyuaian terbaik *Sekurang-kurangnya* *-5 * titik diplot* *-* Jadual dalam 2 tempat perpuluhan*	1	

					
	(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

11	(a)	(i)	$3C1(0.5)(0.5)^2 + 3C2(0.5)^2(0.5)$ 0.75	1 1	
		(ii)	$20\ (0.75)$ OR $\sqrt{20\ (0.75)(0.25)}$ 15 1.936	1 1 1	
	(b)	(i)	39	1	
		(ii)	$P\left(\frac{39-45}{8} \le X \le \frac{55-45}{8}\right)$ 0.6677	1 1	
		(iii)	$P\left(X \le \frac{33-45}{8}\right)$ *OR* *0.06681* 12	1 1	10
12	(a)		$3x + 6y \le 160$ $y \ge x + 10$ $x \ge \frac{1}{10}y$	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
13	(a)			1	
	(b)	(i)	$\frac{1}{2}(9)(BC)\sin 34° = 28$ 11.13	1 1	
		(ii)	$AC^2 = 9^2 + 11.13^2 - 2(9)(11.13)\cos 34°$ 6.228	1 1	
		(iii)	$\frac{\sin \angle ACB}{9} = \frac{\sin 34°}{6.228}$ 53.91°	1 1	
	(c)		 $\angle BAC' = 19.91°$ $\frac{1}{2}(9)(6.228)\sin 19.91°$ 9.544	1 1 1	10
14	(a)		$p = \frac{125 \times 5820}{100}$ 7275	1 1	
	(b)		$\frac{q+200}{q} \times 100 = 140$ $q = 500$ $r = 700$	1 1 1	

	(c)		$I_K = 129 \text{ and } I_L = 87$	1	
			$\bar{I}_{\frac{22}{21}} = \frac{125(1)+129(1)+140(1)+87(1)}{1+1+1+1}$	1	
			$\bar{I}_{\frac{22}{21}} = 120.25$	1	
			$\frac{110}{100} \times 120.25 = 132.28$	1+1	10
15	(a)		$25m + 5n = 0 \text{ or } 5m + n = 0$	1	
			$a = 2mt + n$	1	
			$2m + n = 3$	1	
			$m = -1$	1	
			$n = 5$	1	
	(b)		$-t^2 + 5t > 0$ atau $t^2 - 5t < 0$	1	
			$0 < t < 5$	1	
	(c)		S = $-\frac{t^3}{3} + \frac{5t^2}{2}$	1	
			Use $S_{t=5} - S_{t=4}$	1	
			2.167	1	10