KEMENTERIAN PENDIDIKAN MALAYSIA

i-MODUL KECEMERLANGAN SPM SMKA DAN SABK 2021

SIJIL PELAJARAN MALAYSIA 2021 (SET 1)

MATEMATIK TAMBAHAN

Kertas 2

PERATURAN PEMARKAHAN

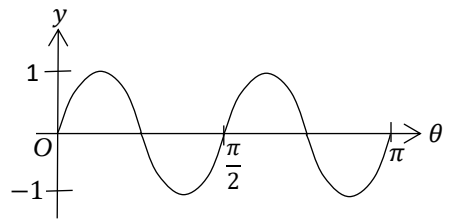
UNTUK KEGUNAAN PEMERIKSA SAHAJA

AMARAN
Peraturan pemarkahan ini SULIT dan **Hak Cipta Majlis Pengetua SMKA** dan **Majlis Pengetua SABK**. Kegunaan khusus untuk guru-guru tingkatan 5 di SMKA dan SABK sahaja. Peraturan ini tidak boleh dikeluarkan dalam apa jua bentuk media cetak.

Peraturan pemarkahan ini mengandungi 9 halaman bercetak

CADANGAN PERATURAN PEMARKAHAN (SKEMA)
Kertas 2 Set 1
BAHAGIAN A

Soalan	Butiran	Markah
1 (a)(i)	$\frac{3}{7}(14\underset{\sim}{u})$ atau $-\frac{4}{7}(14\underset{\sim}{u})$	1
	$6\underset{\sim}{u}$	1
1 (a)(ii)	$-8\underset{\sim}{u}$	1
1 (b)	$\sqrt{2^2+(14y)^2}$ @ $\sqrt{2^2+p^2}=\sqrt{40}$	1
	$\sqrt{2^2+(14y)^2}=\sqrt{40}$ @ $14y=6$	1
	$y=\frac{3}{7}$	1
	$\overrightarrow{PR}=\frac{2\underset{\sim}{i}+6\underset{\sim}{j}}{\sqrt{40}}$	1
		7m
2 (a)	$50+(n-1)(-4)$ @ $36+(n-1)(-3)$	1
	$50+(n-1)(-4)=36+(n-1)(-3)$	1
	$n=15$	1
2 (b)	$r=\frac{13}{12}$	1
	$S_{20}=\frac{3.5(\frac{13}{12}^{20}-1)}{\frac{13}{12}-1}$	1
	166.21 minit	1
	Tidak layak mendapat pingat	1
		7m
3	Katakan x=coklat, y=kurma, z=gula-gula	
	$3x+2y+z=56$ @ $6x+y+4z=83$	1
	2 penyelesaian menghapus/ mengganti pembolehubah	1+1
	Mana-mana satu perkara rumus satu pembolehubah	1
	$x=6$, $y=15$, $z=8$	1+1+1
		7m
4	$x^2+\frac{5}{7}x=\frac{9}{7}$	1
	$x^2+\frac{5}{7}x+\left(\frac{5}{7}\times\frac{1}{2}\right)^2=\frac{9}{7}+\left(\frac{5}{7}\times\frac{1}{2}\right)^2$	1
	$x+\frac{5}{14}=\sqrt{\frac{277}{196}}$	1
	$x=0.832$, $x=-1.55$	1+1
		5m

5 (a)	$g^{-1}(x) = x + 4$	1
	$\dfrac{3 + (x + 4)}{2 + p(x + 4) - 4p}$	1
	$f(x) = \frac{7+x}{2+px}$	1
5 (b)(i)	$2 + px - 4p = 0$	1
	$-\frac{2}{p} + 4 = \frac{10}{3}$	1
	$p = 3$	1
5 (b)(ii)	$\frac{3+(q+3)}{3(q+3)-10} = \frac{1}{2}(6 - 4)$	1
	$q = \frac{7}{2}$	1
		8m
6 (a)	$\sin 4\theta \kos \frac{\pi}{3} - \kos 4\theta \sin \frac{\pi}{3} + \sin 4\theta \kos \frac{\pi}{3} + \kos 4\theta \sin \frac{\pi}{3}$	1
	$2 \sin 4\theta \left(\frac{1}{2}\right) = \sin 4\theta$ (terbukti)	1
6 (b)(i)		
	Bentuk sin	1
	2 kala	1
	Amplitud	1
6 (b)(ii)	$\pi\ (y) = mx - \pi$	1
	$0 = \frac{m}{\pi}\left(\frac{\pi}{2}\right) - 1$	1
	$m = 2$	1
		8m
7 (a)	$7^n(7^2) - 2(7^n \times 7) + 7^n$	1
	$7^n(36)$	1
7 (b)	$\frac{1}{2} \times \sqrt{12} \times (\sqrt{12} + 4\sqrt{3} + 2)$	1
	$\sqrt{3}\ (6\sqrt{3} + 2)$	1
	$18 + 2\sqrt{3}$	1
7 (c)	$\log (a - 3b) = \log \sqrt{ab}$	1
	$(a - 3b) = \sqrt{ab}$	1
	$a^2 - 6ab + 9b^2 = ab$	
	$a^2 + 9b^2 = 7ab$	1
		8m

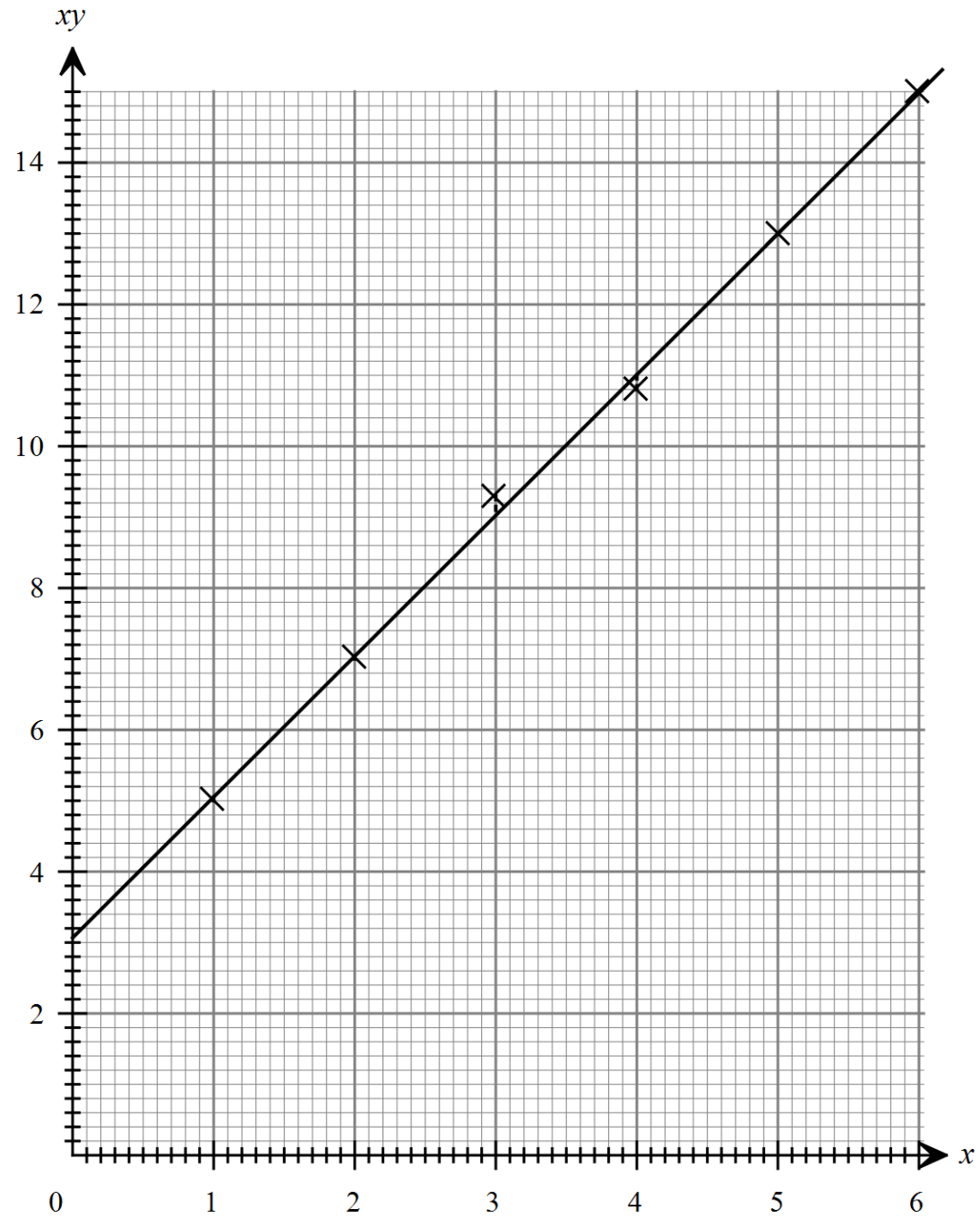
BAHAGIAN B

Pilih mana-mana **tiga** soalan

Soalan	Butiran	Markah
8 (a)		

x	1	2	3	4	5	6
xy	5.0	7.0	9.3	10.8	13	15

	1
Paksi dan 1 titik diplot betul	1
Semua titik diplot betul	1
Garis lurus penyuaian terbaik	1



8 (b)(i)	$xy = \frac{s}{2}x + \frac{t}{2}$	1
8 (b)(ii)	$m = \frac{s}{2} = \frac{13-5}{5-1} = 2$ $\quad c = \frac{t}{2} = 3$ $s = 4 \quad t = 6$	1 1+1
8 (b)(iii)	$xy = 10$ $(3.5)y = 10$ $y = 2.86$	1
8 (c)	$50x = 2x + 3$ $x = 0.0625$	1
		10 m
9 (a)	$7 = 4^2 - k$ $k = 9$ $(x-3)(x+3) = 0$ $x = -3, x = 3$ $P(3,0)$	1 1 1
9 (b)	$\left\|\int_0^3 x^2 - 9dx\right\| + \int_3^4 x^2 - 9dx$ $\left\|\left[\frac{x^3}{3} - 9x\right]_0^3\right\|$ atau $\left[\frac{x^3}{3} - 9x\right]_3^4$ $\left[\frac{3^3}{3} - 9(3)\right] - (0)$ atau $\left[\frac{4^3}{3} - 9(4)\right] - (-18)$ Luas kawasan berlorek = $18 + \frac{10}{3} = \frac{64}{3}$	1 1 1+1
9 (c)	$\pi\int_{-9}^{0} y + 9\,dy$ $\pi\left[\frac{y^2}{2} + 9y\right]_{-9}^{0}$ $\pi\left[0 - \left(\frac{(-9)^2}{2} - 81\right)\right]$ $\frac{81}{2}\pi$ unit^2	1 1 1
		10 m

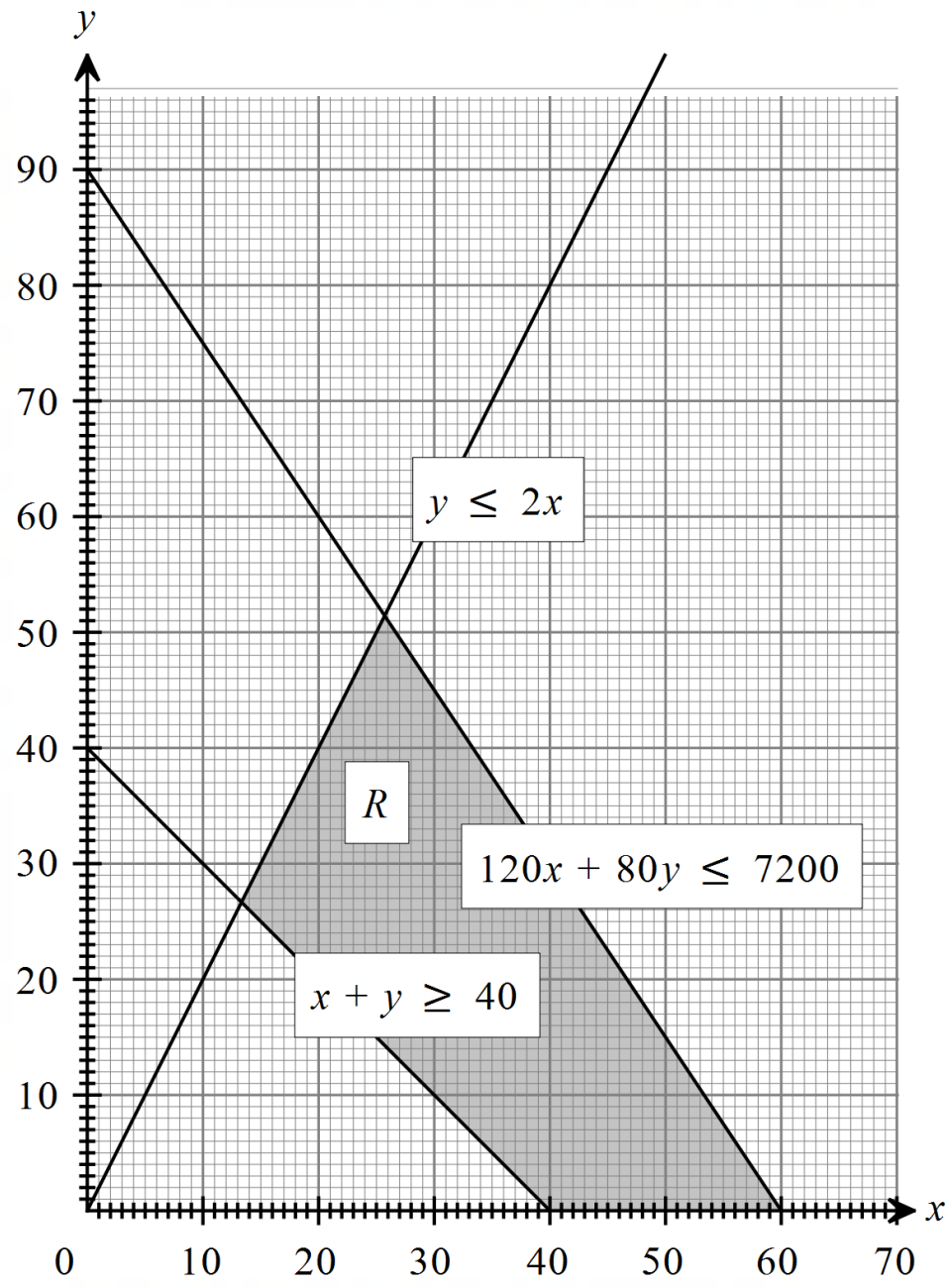
10 (a)(i)	$\overrightarrow{PR} = 6\underset{\sim}{x} + 5\underset{\sim}{y}$	1
10 (a)(ii)	$\overrightarrow{SQ} = \overrightarrow{SR} + \overrightarrow{RQ}$	1
	$= \frac{1}{3}(6\underset{\sim}{x}) - 5\underset{\sim}{y}$	
	$= 2\underset{\sim}{x} - 5\underset{\sim}{y}$	1
10 (b)	$\overrightarrow{ST} + \overrightarrow{TR} = \overrightarrow{SR}$	1
	$\left(2h\underset{\sim}{x} - 5h\underset{\sim}{y}\right) + \left(6k\underset{\sim}{x} + 5k\underset{\sim}{y}\right) = 2\underset{\sim}{x}$	
	$2h + 6k = 2$ atau $-5h + 5k = 0$ atau $h = 1 - 3k$	1
	$-5(1-3k) + 5k = 0$	1
	$k = \frac{1}{4}, h = \frac{1}{4}$	1+1
10 (c)	$\frac{1}{2} \times 4 \times t = 60$	1
	$t = 30$	1
		10 m
11 (a)(i)	$p = \frac{3}{5}, q = \frac{2}{5}$	1
	$P(X = 4) = {}^9C_4 \left(\frac{3}{5}\right)^4 \left(\frac{2}{5}\right)^5$	1
	$= 0.1672$	1
11 (a)(ii)	$P(X \geq 7) = {}^9C_7 \left(\frac{3}{5}\right)^7 \left(\frac{2}{5}\right)^2 + {}^9C_8 \left(\frac{3}{5}\right)^8 \left(\frac{2}{5}\right)^1 + {}^9C_9 \left(\frac{3}{5}\right)^9 \left(\frac{2}{5}\right)^0$	1
	$= 0.2318$	1
11 (b)(i)	$P(56 \leq X \leq 72)$	
	$= P(\frac{56-65}{7.5} \leq Z \leq \frac{72-65}{7.5})$	1
	$= P(-1.2 \leq Z \leq 0.933)$	
	$= 0.7096$	
	$n(s) = \frac{250}{0.7097} = 352$	1
		1
11(b)(ii)	$\frac{X - 65}{7.5} = 1.645$	1
	$X = 77.34kg$	1
		10 m

BAHAGIAN C
Pilih mana-mana **dua** soalan

Soalan	Butiran	Markah
12 (a)	$\frac{dV}{dt} = 4 - 4t = 0$	1+1
	$t = 1$	
	$v_q = 6 + 4(1) - 2(1)$	1
	$v_q = 8ms^{-1}$	1
12 (b)	$6 + 4t - 2t^2 = 0$	
	$(2t + 2)(t - 2)0$	1
	$t = 3$	1
	$s_q = -\frac{2}{3}t^3 + t^2 + 6$	
	$s_q = -\frac{2}{3}(3)^3 + 2(3)^2 + 6(3)$	1
	$s_q = 18meter$	1
12 (c)	33-18-6=9m	1+1
		10 m
13 (a)(i)	$\frac{55}{\sin 48°} = \frac{AB}{\sin 82°}$	1
	$AB = 77.02m$	1
13 (a)(ii)	$25^2 = 55^2 + 70^2 - 2(55)(70)\cos\angle CAD$	1
	$\cos\angle CAD = 0.9481$	1
	$\angle CAD = 18.54°$	1
13 (a)(iii)	Luas segitiga $= \frac{1}{2}(55)(77.02)\sin 50° = 1622.52m$	1+1
13 (b)	$\frac{x}{\sin 80°} = \frac{55}{\sin 50°}$	1+1
	$AP = 70.17m$	1
		10 m

14 (a)	$\frac{6}{x} \times 100 = 125$ x = RM 4.80	1 1
14 (b)	$\frac{z}{y} \times 100 = 110$ $z = y + 0.40$ $\frac{y + 0.40}{y} \times 100 = 110$ $y + 0.40 = 1.1y$ $y = 4.00$ $z = 4.40$	 1 1 1
14 (c)(i)	$\frac{P_{2020}}{12} \times 100 = 122.5$ P_{2020} = RM 14.70	1 1
14 (c)(ii)	$I_P = 125$ $I_Q = \frac{4}{2.50} \times 100 = 160$ $I_R = \frac{10}{8} \times 100 = 125$ $I_S = 110$ $\frac{125(3)+160(1)+125(2)+110m}{3+1+2+m} = 122.5$ $785 + 110m = 122.5\ (6 + m)$ $785 + 110m = 735 + 122.5m$ $m = 4$	 1+1 1
		10 m

15 (a)	$x + y \geq 40$ $y \leq 2x$ $120x + 80y \leq 7200$	1 1 1
15 (b)	Paksi dan satu graf garis lurus betul Semua graf garis lurus betul Kawasan berlorek betul	1 1 1



15 (c)(i)	bilangan minimum 30 bilangan maksimum 53	1 1
15 (c)(ii)	120(14)+80(26) = 3760	1 1
		10 m