

PERATURAN PEMARKAHAN
PEPERIKSAAN PERCUBAAN SPM 2025
KERTAS 2

No	Peraturan Pemarkahan	Markah	Markah Penuh
Bahagian A			
1	(a)	$\frac{5 + \sqrt{3}}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$	1
		$1 + \frac{5}{3}\sqrt{3}$	1
	(b)	<u>Guna hukum indeks</u>	1
		$\frac{k^{\frac{1}{2} + \frac{1}{2}}}{\sqrt{169}} = 6 @ \frac{\left(k^{\frac{1}{2}}\right)^2}{\sqrt{169}} = 6$ $k = 78$	1
	(c)	<u>Guna rumus penukaran asas log</u>	1
		$\frac{\log_4 4}{\log_4 16}$	1
		$5 - 2x = 3^2$ $x = -2$	1
2	(a)	$2x^2 - 19x + 42 = 0$	1
		$(x - 6)(2x - 7) = 0$	1
		$x = 6, x = 3.5$	1
		Lebar = $6 - 3.5$ 2.5	1
3	(a)	$-2 \left(x^2 - \frac{19}{2}x + \left(\frac{-19}{2}\right)^2 - \left(\frac{-19}{2}\right)^2 + 21 \right)$	1
		$-2 \left(x - \frac{19}{4} \right)^2 + \frac{25}{8}$	1
		$\frac{25}{8} @ setara$	1
			1
3	(a)	<u>Guna rumus T_n J.A</u>	1
		$a + 15d = 138$ atau $a + 12d = 145$	1
		$d = -\frac{7}{3}$ dan $a = 173$	1
			1
3	(b)	<u>Guna $T_n < 0$</u>	1
		$*173 + (n-1) \left(-\frac{7}{3} \right) < 0$	1
		$n > 75.14$ dan $n = 76$	1
			1

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(c)	$\frac{40}{2} \left[2^*(173) + (40-1) \left(-\frac{7}{3} \right) \right] \text{ atau } \frac{70}{2} \left[2^*(173) + (70-1) \left(-\frac{7}{3} \right) \right]$ $\frac{70}{2} \left[2^*(173) + (70-1) \left(-\frac{7}{3} \right) \right] - \frac{40}{2} \left[2^*(173) + (40-1) \left(-\frac{7}{3} \right) \right]$ 1375	1 1 1	7
4	$x^2 + y^2 = 13^2$ @ $5x + 2y + 26 = 75$ $y = \frac{49-5x}{2}$ or $x = \frac{49-2y}{5}$ $x^2 + \left(\frac{49-5x}{2} \right)^2 = 13^2$ or $\left(\frac{49-2y}{5} \right)^2 + y^2 = 13^2$ $(29x - 345)(x - 5) = 0$ $x = 5$ dan $y = 12$ $\frac{1}{2} \times 12 \times 5 \times 5$ 150 < 155 dan tidak sesuai	1 1 1 1 1 1 1	7
5	ALTERNATIF A <u>Cari fungsi songsang @ Cari fungsi gubahan</u> $f^{-1}(x) = \frac{m}{x-n} \text{ @ } ff(x) = \frac{m}{\frac{m}{x}+n} + n$ $*(ff(x)) = *f^{-1}(x)$ $(m + n^2) \left(x - \frac{m}{x} - n \right) = 0$ $m + n^2 = 0 \text{ (tertunjuk)}$ ALTERNATIF B Cari $ff(x) = \frac{m}{\frac{m}{x}+n} + n$ @ $fff(x) = \frac{m}{\frac{\frac{m}{\frac{m}{x}+n}+n}+n} + n$ (1) $*fff(x) = x$ (1) $(m + n^2)(x^2 - m - nx) = 0$ (1) $m + n^2 = 0 \text{ (tertunjuk)}$ (1)	1 1 1 1 1	
(b)	ALTERNATIF A $p - 2 = \frac{3}{p}$ $p^2 - 2p - 3 = 0$ $(p + 1)(p - 3) = 0$ $p = -1 \text{ atau } p = 3$ ALTERNATIF B $f^{-1}(x) = \frac{x+3}{2}, ff^{-1}(p-2) = 2 \left(\frac{p-2+3}{2} \right) - 3$	1 1 1 1	

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		$ff^{-1}(p - 2) = p - 2$ $p - 2 = \frac{3}{p}$ $p^2 - 2p - 3 = 0$ $(p + 1)(p - 3) = 0$ $p = -1$ atau $p = 3$	1 1	7
6	(a)	(i) <u>Tulis hukum segi tiga vektor @ hukum poligon</u> $\overrightarrow{CD} = \overrightarrow{CB} + \overrightarrow{BD}$ @ $\overrightarrow{CF} = \overrightarrow{CB} + \overrightarrow{BF}$ @ $\overrightarrow{CE} = \overrightarrow{CB} + \overrightarrow{BA} + \overrightarrow{AE}$ $-25\hat{x} + 12\hat{y}$ (ii) $\overrightarrow{CF} = -10\hat{x}$	1 1 1	7
	(b)	$\overrightarrow{CE} = -25\hat{x}$ $\frac{2}{5}$	1 1	
	(c)	$\sqrt{(5(1))^2 + (4(3))^2}$ 13	1 1	
7	(a)	$\frac{60^\circ \times 3.142}{180^\circ}$ 1.047	1 1	8
	(b)	7×1.047 $7 \times 1.047 + 7$ 14.33	1 1 1	
	(c)	3.142×7^2 atau $\frac{1}{2} (7)^2 (2(3.142))$ atau $\frac{1}{2} (7)(7) \sin 60^\circ$ $\frac{1}{2} (7)^2 (2(3.142)) - \frac{1}{2} (7)(7) \sin 60^\circ$ 132.74	1 1 1	
Bahagian B				
8	(a)	$-2 \times m_{SV} = -1$ dan $m_{SV} = \frac{1}{2}$ $y - 0 = \frac{1}{2}(x - 6)$ atau $0 = \frac{1}{2}(6) + c$ dan selesaikan c $y = \frac{1}{2}x - 3$ atau $2y - x + 6 = 0$ atau setara	1 1 1	
	(b) (i)	$-2x - 8 = \frac{1}{2}x - 3$ $x = -2$ $V(-2, -4)$ $8 = -2x - 8$ $U(-8, 8)$	1 1 1 1 1	

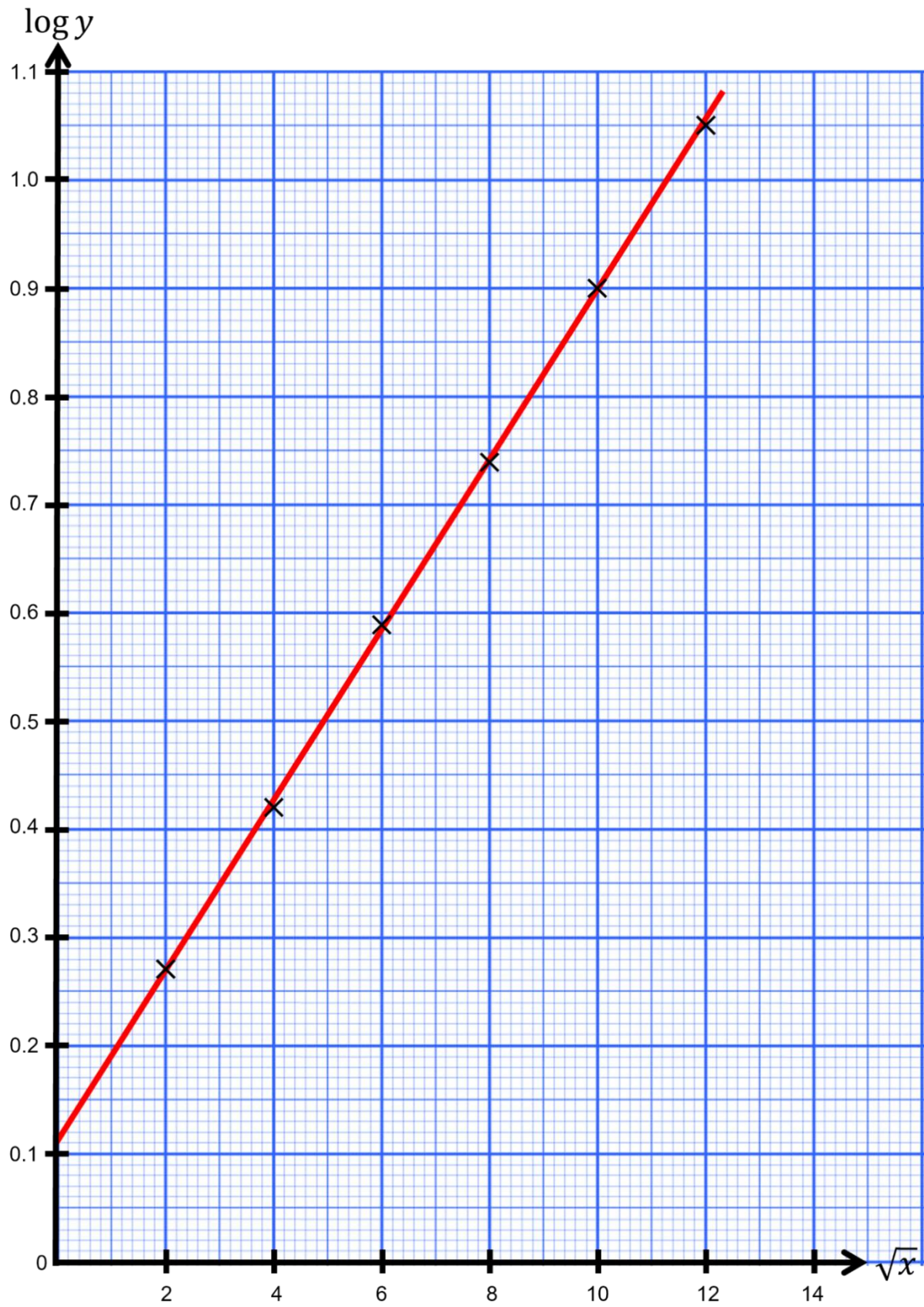
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(b) (ii)	<u>Guna rumus luas poligon</u> $\frac{1}{2} [(6)(8) + (2)(8) + (-8)(-4) + (-2)(0)] - [(0)(2) + (8)(-8) + (8)(-2) + (-4)(6)] $ 100	1 1	10
9	(a) $h = \frac{1000}{\pi r^2}$ $C = 5\pi r^2 + 4\pi r \left(\frac{1000}{\pi r^2} \right)$ $C = 5\pi r^2 + \frac{4000}{r}$ (b) $10(3.142)r - \frac{4000}{r^2} = 0$ $r = 5.031$ $h = 12.57$ $5(3.142)(5.031)^2 + \frac{4000}{5.031}$ 1192.71 (c) $20 = (5.031)^2(3.142) \times \frac{dh}{dt}$ 0.2515	1 1 1 1 1 1 1 1	10
10	(a) Guna $\sin^2 A + \cos^2 A = 1$ @ $\sin 2A = 2 \sin A \cos A$ @ $\cos 2A = \cos^2 A - \sin^2 A$ @ $\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$ LHS = RHS (b) $\tan 2x = \frac{2}{3}$ Sudut rujukan = 33.69° $33.69^\circ, 180^\circ + 33.69^\circ, 360^\circ + 33.69^\circ, 360^\circ + (180^\circ + 33.69^\circ)$ $16.85^\circ, 106.85^\circ, 196.85^\circ$ dan 286.85° (c) Bentuk graf sinus $1\frac{1}{2}$ kitaran Anjakan 1 unit ke atas 3	1 1 1 1 1 1 1 1 1 1 1 1 1	10



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11	(a)	$\sqrt{x}$	2	4	6	8	10	12	1	
		$\log_{10}y$	0.27	0.42	0.59	0.74	0.90	1.05	1	
	(b)	Rujuk pada graf Satu titik diplot betul Semua 6 titik diplot betul Garis lurus penyuaian terbaik							1 1 1	
		(c) (i) (ii)	$\log y = \sqrt{x} \log d + \log r$ $\log r = 0.11$ $r = 1.288$ $\log d = 0.08$ 1.202							
Bahagian C										
12	(a)									
	(i)	$PR^2 = 7.5^2 + 9^2 - 2(7.5)(9) \cos 85^\circ$ 11.20							1 1	
	(ii)	Lihat 95° $\frac{\sin \angle SPR}{4} = \frac{\sin 95^\circ}{11.20}$ 20.84° $180 - 95 - 20.84$ 64.16°							1 1	
		(b)	$\frac{1}{2}(7.5)(9) \sin 85^\circ$ 33.62 $\frac{1}{2}(11.20)(t) = 33.62$ 6.004							
13	(a)	$\frac{6.00}{4.80} \times 100 = 125$ atau $\frac{3.00}{y} \times 100 = 109$ $x = 125$ $y = 2.75$							1 1 1	
	(b)	$\frac{(*125 \times 150) + (109 \times 150) + (105 \times 100) + (120 \times z)}{150 + 150 + 100 + z}$ $\frac{(*125 \times 150) + (109 \times 150) + (105 \times 100) + (120 \times z)}{150 + 150 + 100 + z} = 116$ $z = 200$							1 1 1	
		(c)	ALTERNATIF A $\frac{116 \times 116}{100}$							

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		$\frac{P_{2025}}{4.00} \times 100 = \frac{116 \times 116}{100}$ $5.38 \times \frac{130}{100}$ 7 ALTERNATIF B $\frac{P_{2024}}{4.00} \times 100 = 116 @ \frac{P_{2025}}{P_{2024}} \times 100 = 116 \quad (1)$ $5.38 \quad (1)$ $5.38 \times \frac{130}{100} \quad (1)$ $7 \quad (1)$	1 1 1	10
14	(a)	$t(t-6)(t-10) = 0$ $\therefore t = 6$	1 1	10
	(b)	$\frac{ds}{dt} = 3t^2 - 32t + 60$ $\frac{d^2s}{dt^2} = 6t - 32$ $6(6) - 32$ 4	1 1 1 1	
	(c)	$6t - 32 = 0$ $t = \frac{16}{3}$ $3(\frac{16}{3})^2 - 32(\frac{16}{3}) + 60$ $\frac{76}{3}$	1 1 1 1	
15	(a)	I: $200 \leq x \leq 500$ II: $x + y \leq 700$ III: $x - 2y \leq 200$	1 1 1	10
	(b)	Lukis dengan betul sekurang-kurangnya satu garis lurus dari *ketaksamaan yang melibatkan x dan y Lukis dengan betul semua *garis lurus dari *ketaksamaan di 15(a) Rantau dilorek dengan betul	1 1 1	
	(c)	(i) 450 (ii) $k = 600x + 800y$ @ Lukis garis fungsi objektif <u>Ganti dengan $(200, 500)$ ke dalam $k = 600x + 800y$</u> $600(200) + 800(500)$ Yuran maksimum = RM 520 000	1 1 1 1	

Soalan 11 (b)



Soalan 15 (b)

