PERATURAN PEMARKAHAN
PEPERIKSAAN PERCUBAAN SPM 2025
KERTAS 2

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

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

No		Peraturan Pemarkahan	Markah	Markah Penuh
		$ff^{-1}(p-2) = p-2$ $p-2 = \frac{3}{p}$ $p^2-2p-3=0$ $(p+1)(p-3)=0$ $p=-1\ atau\ p=3$	 1 1	7
6	(a)	(i) Tulis hukum segi tiga vektor @ hukum poligon $\overrightarrow{CD}=\overrightarrow{CB}+\overrightarrow{BD}$ @ $\overrightarrow{CF}=\overrightarrow{CB}+\overrightarrow{BF}$ @ $\overrightarrow{CE}=\overrightarrow{CB}+\overrightarrow{BA}+\overrightarrow{AE}$ $-25\underset{\sim}{x}+12\underset{\sim}{y}$ (ii) $\overrightarrow{CF}=-10\underset{\sim}{x}$	 1 1 1	
	(b)	$\overrightarrow{CE}=-25\underset{\sim}{x}$ $\frac{2}{5}$	1 1	
	(c)	$\sqrt{(5(1))^2+(4(3))^2}$ 13	1 1	7
7	(a)	$\frac{60°\times 3.142}{180°}$ 1.047	1 1	
	(b)	$7\times^{*}1.047$ $7\times^{*}1.047+7$ 14.33	1 1 1	
	(c)	3.142×7^2 atau $\frac{1}{2}(7)^2(2(3.142))$ atau $\frac{1}{2}(7)(7)\sin 60°$ $\frac{1}{2}(7)^2\left(2(3.142)\right)-\frac{1}{2}(7)(7)\sin 60°$ 132.74	1 1 1	8
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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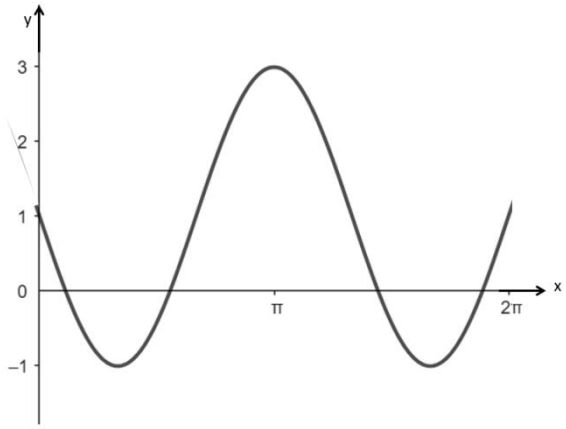
	(b) (ii)	Guna rumus luas poligon $\frac{1}{2}\|[(6)(8)+(2)(8)+*(-8)*(-4)+*(-2)(0)]-[(0)(2)+(8)*(-8)+(8)*(-2)+*(-4)(6)]\|$ 100	1 1	10
9	(a)	$h=\frac{1000}{\pi r^2}$ $C=5\pi r^2+4\pi r\left(\frac{1000}{\pi r^2}\right)$ $C=5\pi r^2+\frac{4000}{r}$	1 1 1	
	(b)	$10(3.142)r-\frac{4000}{r^2}=0$ $r=5.031$ $h=12.57$ $5(3.142)(5.031)^2+\frac{4000}{5.031}$ 1192.71	1 1 1 1 1	
	(c)	$20=(5.031)^2(3.142)\times\frac{dh}{dt}$ 0.2515	1 1	10
10	(a)	Guna $\sin^2 A+\kos^2 A=1$ @ $\sin 2A=2\sin A\kos A$ @ $\kos 2A=\kos^2 A-\sin^2 A$ @ $\tan 2A=\frac{2\tan A}{1-\tan^2 A}$ $LHS=RHS$	1 1	
	(b)	$\tan 2x=\frac{2}{3}$ $Sudut\ rujukan=33.69°$ 33.69°,180°+33.69°,360°+33.69°, 360+(180°+33.69°) $16.85°, 106.85°, 196.85°\ dan\ 286.85°$	1 1 1 1	
	(c)	 Bentuk graf sinus $1\frac{1}{2}$ kitaran Anjakan 1 unit ke atas 3	1 1 1 1	10

<table>
<tr><th colspan="2">No</th><th>Peraturan Pemarkahan</th><th>Markah</th><th>Markah Penuh</th></tr>
<tr><td rowspan="3">11</td><td>(a)</td><td>
<table>
<tr><td>$\sqrt{x}$</td><td>2</td><td>4</td><td>6</td><td>8</td><td>10</td><td>12</td></tr>
<tr><td>$\log_{10} y$</td><td>0.27</td><td>0.42</td><td>0.59</td><td>0.74</td><td>0.90</td><td>1.05</td></tr>
</table>
</td><td>1

1</td><td rowspan="3">10</td></tr>
<tr><td>(b)</td><td>Rujuk pada graf
Satu titik diplot betul
Semua 6 titik diplot betul
Garis lurus penyuaian terbaik</td><td>
1
1
1</td></tr>
<tr><td>(c)
(i)

(ii)</td><td>$\log y = \sqrt{x}\log d + \log r$
$\log r = 0.11$
$r = 1.288$
$\log d = 0.08$
1.202</td><td>1
1
1
1
1</td></tr>
<tr><td colspan="5">Bahagian C</td></tr>
<tr><td rowspan="2">12</td><td>(a)
(i)

(ii)</td><td>
$PR^2 = 7.5^2 + 9^2 - 2(7.5)(9)\ kos\ 85°$
11.20
Lihat 95°
$\frac{sin\angle SPR}{4} = \frac{\sin 95°}{11.20}$
$20.84°$
$180 - 95 - 20.84$
$64.16°$</td><td>
1
1
1
1

1
1</td><td rowspan="2">10</td></tr>
<tr><td>(b)</td><td>$\frac{1}{2}(7.5)(9)\sin 85°$
33.62
$\frac{1}{2}(11.20)(t) = 33.62$
6.004</td><td>1

1

1
1</td></tr>
<tr><td rowspan="3">13</td><td>(a)</td><td>$\frac{6.00}{4.80} \times 100 = 125$ atau $\frac{3.00}{y} \times 100 = 109$
$x = 125$
$y = 2.75$</td><td>1
1
1</td><td rowspan="3"></td></tr>
<tr><td>(b)</td><td>$\frac{(*125 \times 150) + (109 \times 150) + (105 \times 100) + (120 \times z)}{150 + 150 + 100 + z}$
$\frac{(*125 \times 150) + (109 \times 150) + (105 \times 100) + (120 \times z)}{150 + 150 + 100 + z} = 116$
$z = 200$</td><td>1

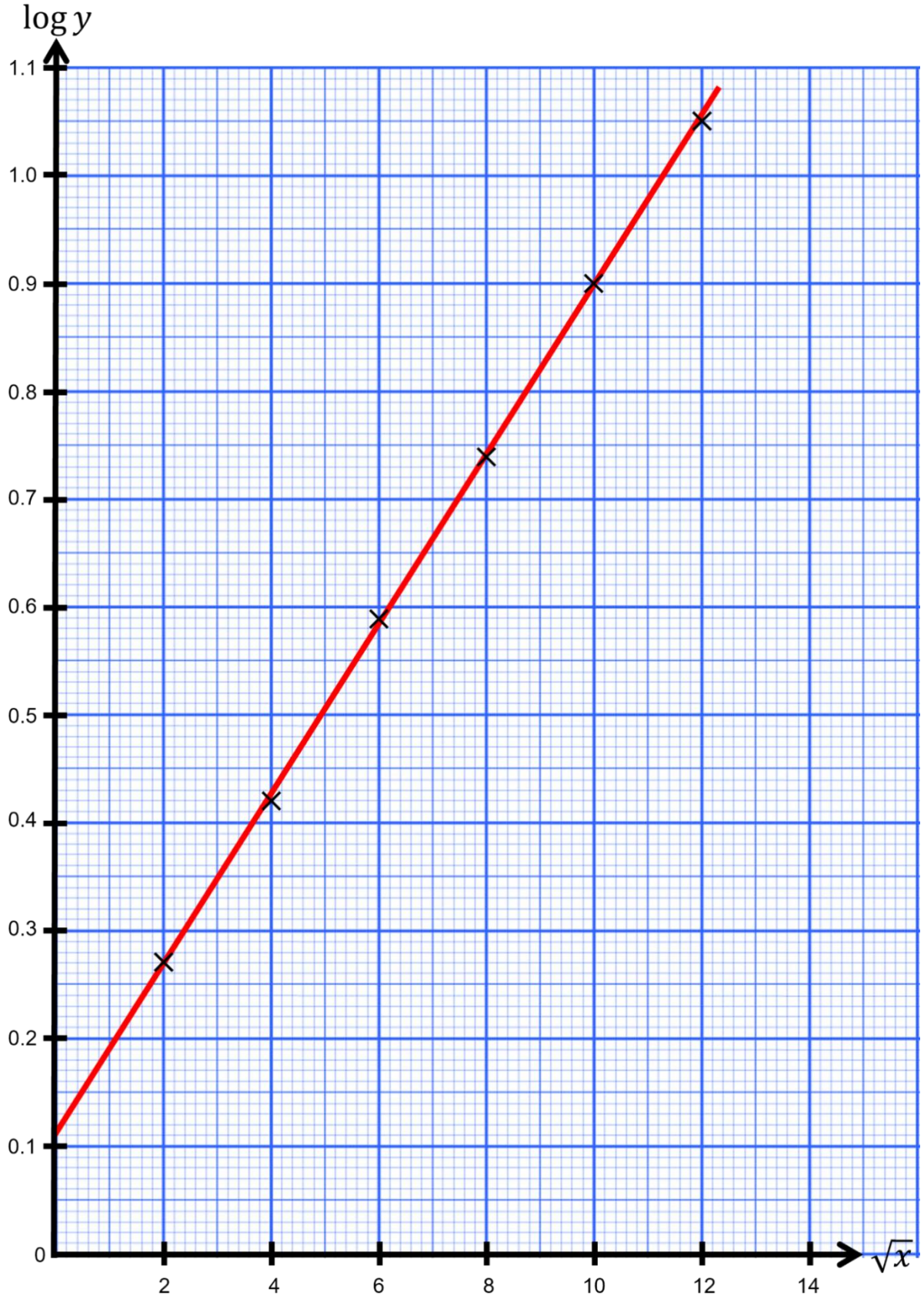
1
1</td></tr>
<tr><td>(c)</td><td>ALTERNATIF A

$\frac{116 \times 116}{100}$</td><td>

1</td></tr>
</table>

No		Peraturan Pemarkahan	Markah	Markah Penuh
		$\frac{P_{2025}}{4.00} \times 100 = \frac{116 \times 116}{100}$ $5.38 \times \frac{130}{100}$ 7 ALTERNATIF B $\frac{P_{2024}}{4.00} \times 100 = 116$ @ $\frac{P_{2025}}{P_{2024}} \times 100 = 116$ (1) 5.38 (1) $5.38 \times \frac{130}{100}$ (1) 7 (1)	1 1 1	10
14	(a)	$t(t\text{-}6)(t\text{-}10) = 0$ $\therefore t = 6$	1 1	
	(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	10
15	(a)	I: $200 \leq x \leq 500$ II: $x + y \leq 700$ III: $x - 2y \leq 200$	1 1 1	
	(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) $k = 600x + 800\,y$ @ Lukis garis fungsi objektif <u>Ganti dengan (200, 500) ke dalam $k = 600x + 800\,y$</u> $600(200) + 800(500)$ Yuran maksimum = RM 520 000	1 1 1 1	10

Soalan 11 (b)



Soalan 15 (b)