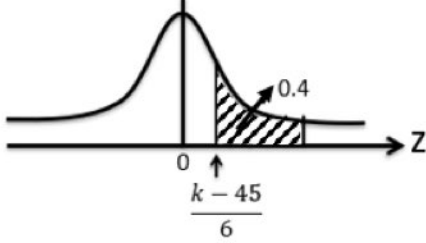
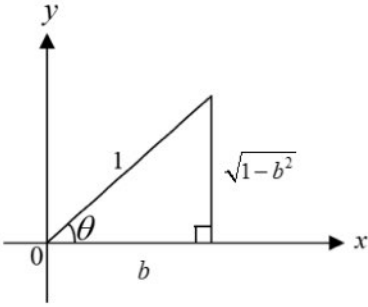


MODUL PINTAS PPC 2026 MATEMATIK TAMBAHAN
PERATURAN PEMARKAHAN TINGKATAN 5 KERTAS 1

SOALAN			PEMARKAHAN	SUB MARKAH	MARKAH
1	(a)		$\log_{10} y = \log_{10} k(\sqrt{x}) + \log_{10} p$	P1	
			$X = \sqrt{x}, Y = \log_{10} y$	N1	
	(b)		$\log_{10} p = -1$	K1	
			@ $-1 = \log_{10} k(0) + \log_{10} p$		
			$\frac{1}{10}$	N1	
					4
2	(a)		$f(-4) = -4 + 2$ @ $f(8) = 2 - 8$	K1	
			$f(-4) = -2$	N1	
			$f(8) = -6$	N1	
	(b)		Domain = $-3 \leq x \leq 3$	P1	
			Julat = $-1 \leq f(x) \leq 2$	P1	
					5
3	(a)		$\begin{pmatrix} 8+h \\ 9 \end{pmatrix}$	N1	
			$\sqrt{(8+h)^2 + 9^2} = \sqrt{277}$ & selesaikan h .	K1	
			6	N1	



	(b)		$\overrightarrow{AO} + \overrightarrow{OB} @ \begin{pmatrix} -5 \\ -12 \end{pmatrix} + \begin{pmatrix} -3 \\ 2 \end{pmatrix}$	K1	
			$\begin{pmatrix} -8 \\ -10 \end{pmatrix}$	N1	
					5
4	(a)		$\alpha + \beta = \frac{5}{3}$	N1	
			$\alpha\beta = -\frac{7}{3}$	N1	
	(b)		$2\alpha + 2\beta = 2\left(\frac{5}{3}\right) \text{ \& } (2\alpha)(2\beta) = 4\left(\frac{-7}{3}\right)$	K1	
			$3x^2 - 10x - 28 = 0$	N1	
					4
5	(a)	(i)	5040	N1	
		(ii)	$\frac{5! \times 4!}{2! \times 2!}$	K1	
			720	N1	
	(b)		${}^6C_4 \times {}^8C_6 @ {}^6C_5 \times {}^8C_5 @ {}^6C_6 \times {}^8C_4$	K1	
			$({}^6C_4 \times {}^8C_6) + ({}^6C_5 \times {}^8C_5) + ({}^6C_6 \times {}^8C_4)$	K1	
			826	N1	
					6
6			$3P(X > k) = 2[1 - P(X > k)]$	K1	
			$P\left(z > \frac{k-45}{6}\right) = \frac{2}{5}$ &	K1	

					
			$\frac{k-45}{6} = 0.253$	K1	
			46.52	N1	
					4
7	(a)		$\int 2g(x)dx = \frac{4x-1}{x^2-3}$	P1	
			$\frac{1}{2} \left[\left(\frac{4(2)-1}{(2)^2-3} \right) - \left(\frac{4(0)-1}{(0)^2-3} \right) \right] @ \text{ setara}$	K1	
			$\frac{10}{3}$	N1	
	(b)		$24 \left[\frac{(3x-1)^{-4}}{3(-4)} \right] + c$	K1	
			$n = 4, m = -2$	N1	
					5
8	(a)		$\frac{1}{b}$	N1	
	(b)			P1	
			Guna rumus $\tan(A-B)$ & gantikan $\tan \theta$ sebagai $\frac{\sqrt{1-b^2}}{b}$	K1	

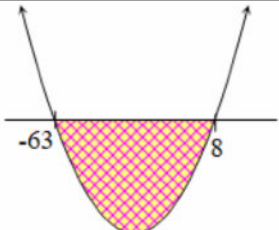
			$-\frac{\sqrt{1-b^2}}{b}$	N1	
					4
9	(a)	(i)	$\cos \angle BDC = \frac{40}{60} @ \text{ setara}$	K1	
			1.682 rad	N1	
		(ii)	(60)(1.682)	K1	
			100.92	N1	
	(b)		$\frac{1}{2}(60)^2(3.142) @ \frac{1}{2}(60)(60)\sin 96.38^\circ$	K1	
			$\frac{1}{2}(60)^2(3.142) - \frac{1}{2}(60)(60)\sin 96.38^\circ$	K1	
			$*3866.75 \times 5 @ \frac{18000}{*3866.75}$	K1	
			Tidak mencukupi kerana $18000 < 19333.75$ @ Tidak mencukupi kerana hanya 4 tingkap yang boleh ditampal selengkapnya.	N1	
					8
10	(a)		Selesaikan persamaan serentak	K1	
			$(1,1) \& m = \frac{1}{4}$	K1	
			Ganti $(1,1)$ ke dalam $y = \left(\frac{1}{4}\right)x + c$, selesaikan untuk c. @ $y - 1 = \frac{1}{4}(x - 1)$	K1	
			$4y = x + 3 @ \text{ setara}$	N1	



	(b)		$\frac{8-2}{2k-1} @ \frac{k-8}{12-2k}$	K1	
			$*\left(\frac{8-2}{2k-1}\right) \times * \left(\frac{k-8}{12-2k}\right) = -1$ & selesaikan *persamaan kuadratik.	K1	
			$k = 3$ & $k = 5$	N1	
					7
11	(a)		$f(x) = -\left[x^2 - 2hx + \left(\frac{-2h}{2}\right)^2 - \left(\frac{-2h}{2}\right)^2 + 5h\right]$ @ $f(x) = -\left[x^2 - 2hx + \left(\frac{-2h}{2}\right)^2 - \left(\frac{-2h}{2}\right)^2\right] - 5h$	K1	
			$f(x) = -(x-h)^2 + h^2 - 5h$	N1	
			$h^2 - 5h = 6$ & selesaikan h	K1	
			$h = 6, h = -1$	N1	
	(b)		$g(x) = (x-6)^2 - 6$	N1	
					5
12	(a)	(i)	$\{(2,q), (2,s), (4,p), (4,r), (6,q)\}$	N1	
		(ii)	Banyak kepada banyak	P1	
		(iii)	$\{p, q, r, s\}$	N1	
	(b)	(i)	$g(x) = x + 1$	N1	
		(ii)	$f^2(x) = \frac{1}{\left(2\left(\frac{1}{2x+1}\right) + 1\right)} @ gf(x) = \left(\frac{1}{2x+1}\right) + 1$	K1	

			$\frac{1}{\left(2\left(\frac{1}{2x+1}\right)+1\right)}=\left(\frac{1}{2x+1}\right)+1$ & selesaikan x .	K1	
			$x=-\frac{5}{6}$	N1	
					7
13	(a)		$\frac{r}{h}=\frac{15}{25}$	P1	
			$r=\frac{3}{5}h$ dan gantikannya ke dalam $V=\frac{1}{3}\pi r^2h$	K1	
			$V=\frac{3}{25}\pi h^3$	N1	
	(b)		$\text{Bezakan } V=\frac{3}{25}\pi h^3$ $\frac{dV}{dh}=3\left(\frac{3}{25}\right)\pi h^2$	K1	
			$\delta v=3\left(\frac{3}{25}\pi(10)^2\right)\times(-0.02)$	K1	
			-0.72π	N1	
			$\frac{-0.72\pi}{\frac{3}{25}\pi(10)^3}\times 100\%$	K1	
			-0.6%	N1	
					8
14	(a)		$2^x\times 4^{x+1}=4^{x+2}$	P1	
			Guna hukum indeks $(a^m)^n=a^{mn}$ @ $a^m\times a^n=a^{m+n}$	K1	
			Bandingkan kuasa bagi asas 2 @ asas 4	K1	

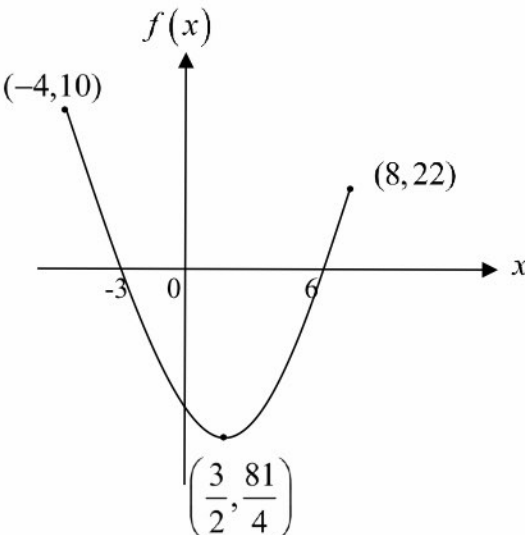
			2	N1	
	(b)		$\frac{t+\sqrt{5}}{4-\sqrt{5}} \times \frac{4+\sqrt{5}}{4+\sqrt{5}}$	K1	
			$\frac{4t+t\sqrt{5}+4\sqrt{5}+5}{16-5}$	K1	
			<u>Hapuskan t dalam sebutan x dan y</u> $\frac{4(11y-4)+5}{11} = x$ @ setara	K1	
			$x = 4y - 1$	N1	
					8
15	(a)		$\pi\left(\frac{1}{2}b\right)^2 h$ @ $\pi\left(\frac{1}{2}b\right)^2 (h+2)$ @ $\pi\left(\frac{1}{2}b\right)^2 (h+4)$	K1	
			$d_1 = \pi\left(\frac{1}{2}b\right)^2 (h+2) - \pi\left(\frac{1}{2}b\right)^2 h$ & $d_2 = \pi\left(\frac{1}{2}b\right)^2 (h+4) - \pi\left(\frac{1}{2}b\right)^2 (h+2)$	K1	
			Janjang aritmetik & $d = \frac{1}{2}\pi b^2$	N1	
	(b)		$\frac{1}{4}\pi b^2(56) + (6-1)\left(\frac{1}{2}\pi b^2\right) = 19074\pi$ & Selesaikan b	K1	
			34	N1	
	(c)		$\frac{n}{2}\left[2\left(\frac{1}{4}\pi(34)^2(56)\right) + (n-1)\left(\frac{1}{2}\pi(34)^2\right)\right] \leq 145656\pi$	K1	
			<u>Selesaikan *ketaksamaan kuadratik</u> $(n-8)(n+63) \leq 0$ &	K1	

			 @ kaedah garis nombor @ kaedah jadual		
			8	N1	
					8

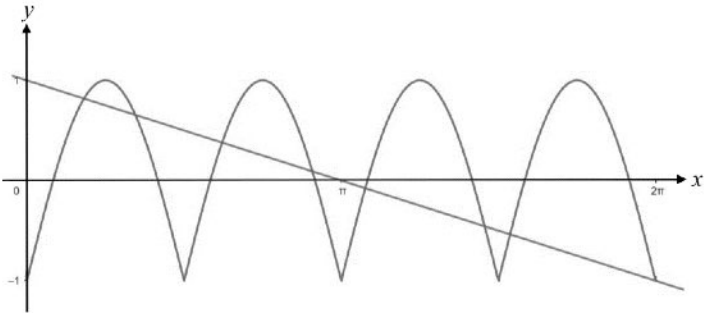
 SERTAI TELEGRAM @exercise_students

MODUL PINTAS PPC 2026 MATEMATIK TAMBAHAN
PERATURAN PEMARKAHAN TINGKATAN 5 KERTAS 2

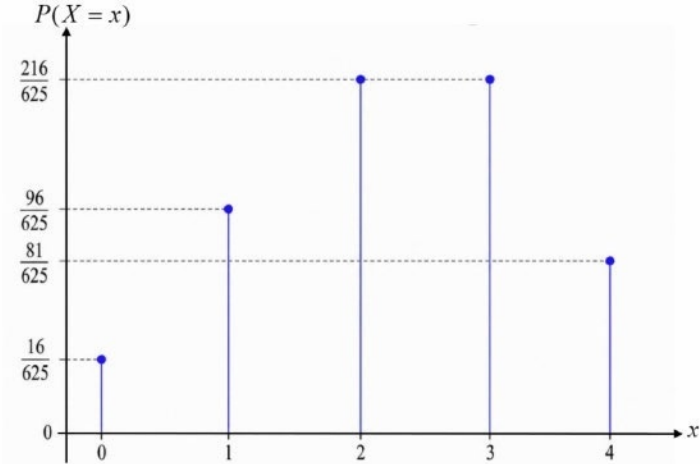
SOALAN			PEMARKAHAN	SUB MARKAH	MARKAH
1			$y = 22 - 3x$	K1	
			$x^2 - 2x(22 - 3x) = -45$	K1	
			Selesaikan *persamaan kuadratik. $x = \frac{-(-44) \pm \sqrt{(-44)^2 - 4(7)(45)}}{2(7)}$	K1	
			$x = 5 \quad , \quad x = 1.286$	N1	
			$y = 7 \quad , \quad y = 18.14$	N1	
					5
2	(a)	(i)	$3^2 - 4(-1)(18) = 81$	K1	
		(ii)	$81 > 0$ dan Dua punca nyata dan berbeza	N1	
		(ii)	$f(x) = x^2 - 3x + \left(-\frac{3}{2}\right)^2 - \left(-\frac{3}{2}\right)^2 - 18$	K1	
			$f(x) = \left(x - \frac{3}{2}\right)^2 - \frac{81}{4}$	N1	
	(b)	(ii)	Bentuk graf & Kedua-dua paksi menggunakan alat tepi lurus. Melalui titik $(-4,10)$, $(8,22)$, $\left(\frac{3}{2}, -\frac{81}{4}\right)$ & paksi dan asalan dilabel.	P1 P1	

					
					6
3	(a)		$\frac{3}{2}x + \frac{7}{2} = -\frac{2}{3}x - \frac{5}{6}$	K1	
			$\left(-2, \frac{1}{2}\right)$	N1	
	(b)		$-2 = \frac{(b-a)(1)+a(-5)}{a+b-a} @ \frac{1}{2} = \frac{(b-a)\left(-\frac{3}{2}\right)+a\left(\frac{5}{2}\right)}{a+b-a}$	K1	
			1:2	N1	
	(c)		$\frac{1}{2} \left \left(-3 \left(-\frac{3}{2} \right) + 1 \left(\frac{5}{2} \right) + (-5)(-1) \right) - \left(-1(1) + \left(-\frac{3}{2} \right)(-5) + \frac{5}{2}(-3) \right) \right $	K1	
			$\frac{13}{2}$	N1	
	(d)		$\sqrt{(x-(-2))^2 + \left(y-\frac{1}{2}\right)^2} = 3$	K1	
			$4x^2 + 4y^2 + 16x - 4y - 19 = 0$	N1	
			$4(-2)^2 + 4(3)^2 + 16(-2) - 4(3) - 19$	K1	
			$-11 \neq 0$, tidak berada pada lokus	N1	
					10

4	(a)		$x = \frac{3+\sqrt{2}}{2-\sqrt{2}} \times \frac{2+\sqrt{2}}{2+\sqrt{2}}$	K1	
			$x = \frac{6+3\sqrt{2}+2\sqrt{2}+2}{4-2}$	K1	
			$x = 4 + \frac{5\sqrt{2}}{2}$	N1	
	(b)		$\ln 3(2x-1) = 2$	K1	
			$3(2x-1) = e^2$	K1	
			$x = \frac{e^2}{6} + \frac{1}{2} \quad @ \quad x = \frac{e^2+3}{6} \quad @ \quad x = 1.7315$	N1	
					6
5	(a)	(i)	$\frac{dh}{dx} = 4x \quad @ \quad \frac{dk}{dx} = \frac{2}{\sqrt{4x+1}}$	K1	
			Guna petua rantai dan ganti nilai $x=2$ $\frac{2}{\sqrt{4(2)+1}} \times \frac{1}{4(2)}$	K1	
			$\frac{1}{12}$	N1	
	(b)		$f'(t) = 3t^2 + 10t + 12 \quad \& \quad f''(t) = 6t + 10$	K1	
			$(t-2)(t+2) = 0$	K1	
			$t = 2, -2$	N1	
	(c)		$\lim_{x \rightarrow 2} \frac{(x-2)(x+3)}{(x-2)}$	K1	
			5	N1	
					8

6	(a)		$\sin(x + x) = \sin x \cos x + \cos x \sin x$	K1	
			$\sin(2x) = 2 \sin x \cos x$	N1	
	(b)	(i)			
			Bentuk graf sin	P1	
			Amplitud dan kitaran	P1	
			Modulus dan translasi	P1	
		(ii)	Garis lurus $y = 1 - \frac{x}{\pi}$ dilakar dan dilabel	K1	
			Bilangan penyelesaian = 8	N1	
					7
7	(a)		$\frac{x}{x-15} = \frac{3x+20}{x}$	K1	
			20	N1	
			4	N1	
	(b)		$80 = a(4)^{4-1}$	K1	
			$\frac{5}{4}$	N1	

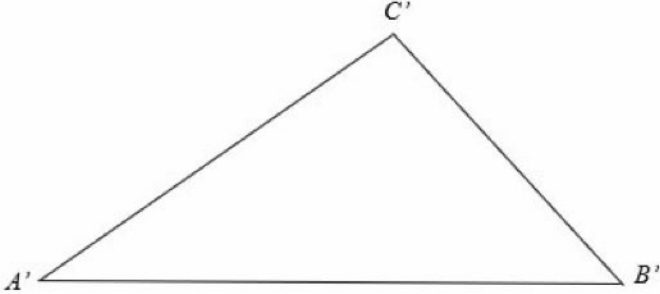
	(c)		$\frac{5}{4}(4^n - 1) > 400000$	K1	
			$n \log 4 > \log 960001$	K1	
			10	N1	
					8
8	(a)		Taburan Binomial	N1	
	(b)	(i)	$2.4 = 4(p)$	K1	
			$1 - 0.6$	K1	
			0.4	N1	
		(ii)	$P(X = 2) + P(X = 3) + P(X = 4) @ setara$	K1	
			${}^4C_2 (0.6)^2 (0.4)^{4-2} @ {}^4C_3 (0.6)^3 (0.4)^{4-3} @ {}^4C_4 (0.6)^4 (0.4)^{4-4}$	K1	
			0.8208	N1	

	(c)	(i)	 Sekurang-kurangnya dua palang dilakar & dilabel dengan betul	N1 N1	
			Ya, $0.4752 \geq 0.47$	N1	
					10
9	(a)	(i)	$\left[-\frac{y^3}{12} \right]_0^k$	K1	
			$\left[\left(-\frac{(k)^3}{12} \right) - \left(-\frac{(0)^3}{12} \right) \right]_0^k = \frac{2}{3}$	K1	
			$k = 2$	N1	
		(ii)	$P(-1,2)$	N1	
	(b)	(i)	$x^2 = x$	K1	
			(1,1)	N1	

		(ii)	$\pi \left[\frac{x^5}{5} \right]_0^1$	K1	
			$\pi \left[\left(\frac{1^5}{5} \right) - 0 \right]$	K1	
			$\left[\frac{1}{3} \times \pi \times 1^2 \times 1 \right] - \pi \left[\left(\frac{1^5}{5} \right) - 0 \right]$	K1	
			$\frac{2}{15} \pi$	N1	
					10
10	(a)	(i)	$\overrightarrow{AB} = \overrightarrow{AO} + \overrightarrow{OB} \text{ \& } \frac{6\hat{i} + 6\hat{j}}{\sqrt{6^2 + 6^2}}$	K1	
			$\frac{1}{\sqrt{2}}\hat{i} + \frac{1}{\sqrt{2}}\hat{j}$	N1	
		(ii)	$9 \left(\frac{1}{\sqrt{2}}\hat{i} + \frac{1}{\sqrt{2}}\hat{j} \right)$	K1	
			$4\hat{i} + 3\hat{j} + 9 \left(\frac{1}{\sqrt{2}}\hat{i} + \frac{1}{\sqrt{2}}\hat{j} \right)$	K1	
			$\left(4 + \frac{9}{\sqrt{2}} \right)\hat{i} + \left(3 + \frac{9}{\sqrt{2}} \right)\hat{j}$	N1	
	(b)	(i)	$q \left(\frac{2}{3}\hat{a} - \hat{b} \right)$	K1	
			$\frac{2}{3}q\hat{a} + (1-q)\hat{b}$	N1	
		(ii)	$\overrightarrow{OM} = \frac{4}{5} \left[\hat{b} + \frac{1}{2}(-\hat{b} + \hat{a}) \right]$	K1	
			$\frac{2}{3}q\hat{a} + (1-q)\hat{b} = \frac{2}{5}\hat{a} + \frac{2}{5}\hat{b} \text{ \& } \frac{2}{3}q = \frac{2}{5}$	K1	
			$q = \frac{3}{5}$	N1	
					10

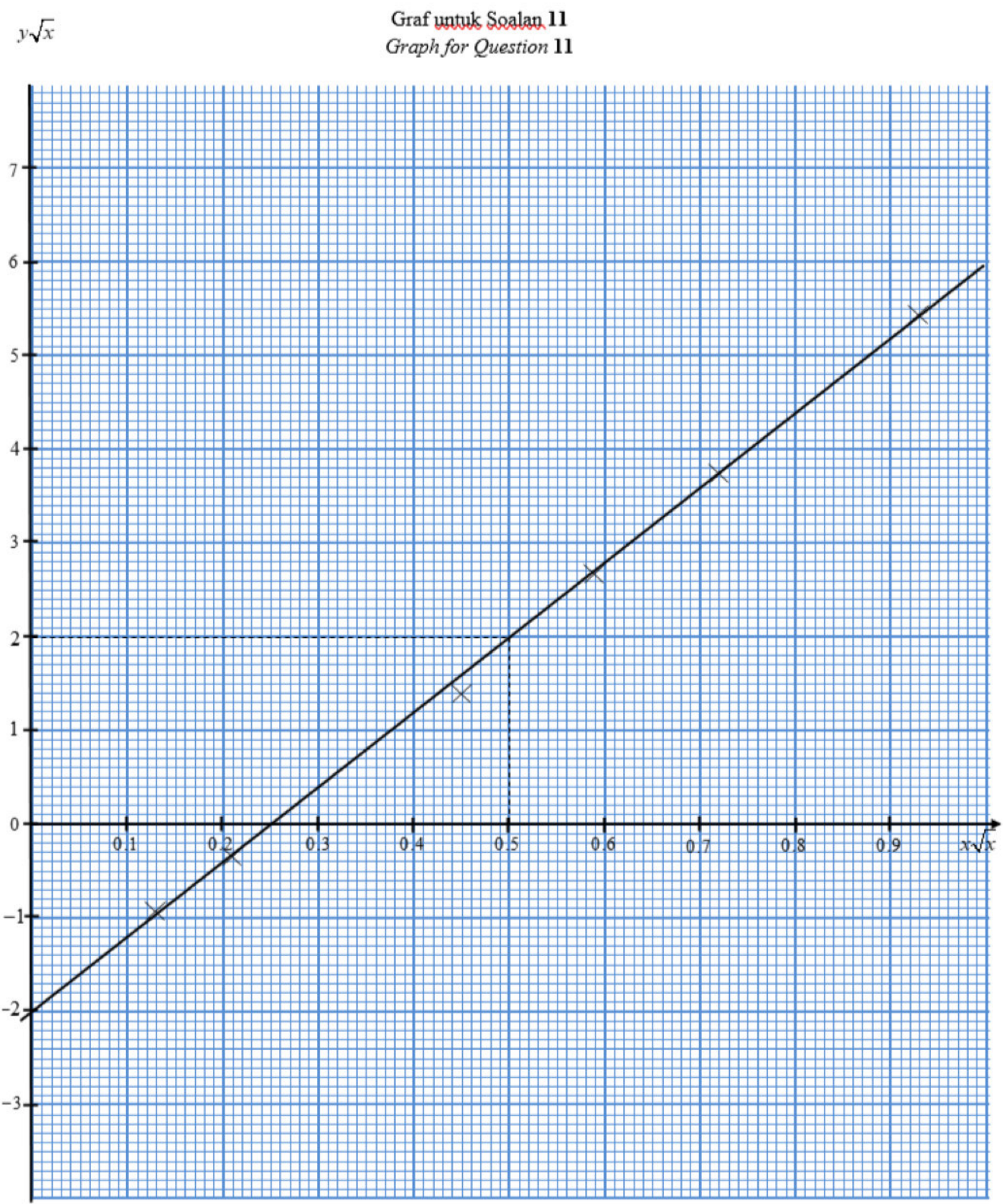
11	(a)		<table><tr><td>$x\sqrt{x}$</td><td>0.13</td><td>0.21</td><td>0.45</td><td>0.59</td><td>0.72</td><td>0.93</td></tr><tr><td>$y\sqrt{x}$</td><td>-0.94</td><td>-0.34</td><td>1.40</td><td>2.69</td><td>3.72</td><td>5.41</td></tr></table>	$x\sqrt{x}$	0.13	0.21	0.45	0.59	0.72	0.93	$y\sqrt{x}$	-0.94	-0.34	1.40	2.69	3.72	5.41	N1 N1	
		$x\sqrt{x}$	0.13	0.21	0.45	0.59	0.72	0.93											
$y\sqrt{x}$	-0.94	-0.34	1.40	2.69	3.72	5.41													
	(b)		Rujuk graf pada lampiran. Graf garis lurus $y\sqrt{x}$ melawan $x\sqrt{x}$ dilukis. [Paksi-paksi betul, skala seragam dan sekurang-kurangnya 1 titik diplot dengan betul.]	K1															
			Semua 6 titik diplot dengan betul.	N1															
			Garis lurus penyuaian terbaik dilukis [Sekurang-kurangnya 5 titik diplot]	N1															
	(c)		$y\sqrt{x} = \frac{a}{2}x\sqrt{x} + b$	P1															
		(i)	$\frac{a}{2} = m$	K1															
			$a = 15.94$	N1															
		(ii)	$-1.9 \leq b \leq -2.1$	N1															
		(iii)	0.63	N1															
					10														
12	(a)	(i)	$\frac{P_{2023}}{4.50} \times 100 = 120$ @ $\frac{7}{P_{2020}} \times 100 = 140$	K1															
			5.40	N1															
		(ii)	5.00	N1															

	(b)		30 dilihat	P1	
			$\frac{120(2)+110(3)+k(3)+140(2)}{20+30+30+20}=122.40$	K1	
			124.67	N1	
	(c)		$\frac{122.4(128.6)}{100}$	K1	
			157.41	N1	
	(d)		$\frac{50-39.35}{39.35}\times 100$	K1	
			27.06%	N1	
					10
13	(a)	(i)	$BC^2=100^2+24.87^2-2(100)(24.87)\cos 32^\circ$	K1	
			80	N1	
		(ii)	$\frac{\sin \angle ACB}{24.87}=\frac{\sin 32^\circ}{80}$	K1	
			9.48	N1	
	(b)	(i)	$\frac{1}{2}*(100)*(80)\sin *9.48^\circ$	K1	
			658.81	N1	
		(ii)	$\frac{1}{2}(100)(t)=*658.81$	K1	
			13.18	N1	

	(c)	(i)	 Catatan : $\angle B'$ adalah sudut tirus	N1	
		(ii)	106.52°	N1	
					10
14	(a)		$4x + y \leq 210$	N1	
			$2x + 3y \geq 180$	N1	
			$x - y \leq 10$	N1	
	(b)		Rujuk graf pada lampiran. Lukis dengan betul sekurang-kurangnya satu garis lurus daripada ketaksamaan yang melibatkan x dan y .	K1	
			Ketiga-tiga garis lurus dilukis dengan betul daripada ketaksamaan yang melibatkan x dan y .	K1	
			Rantau dilabel R dengan betul	N1	
	(c)	(i)	6300	N1	
		(ii)	$k = 9.5x + 2y$	N1	
			Lukis * ($k = 9.5x + 2y$) & Ganti titik (44, 34) ke dalam $9.5x + 2y$	K1	
			486.00	N1	
					10

15	(a)		3	N1	
	(b)		$-2t + 2 \quad \& \quad \frac{dv}{dt} = 0$	K1	
			$-(1)^2 + 2(1) + 3$	K1	
			4	N1	
	(c)		$v = 0 \quad \& \quad \text{selesaikan}$ $-t^2 + 2t + 3 = 0 \quad \& \quad (t - 3)(t + 1) = 0$	K1	
			3	N1	
	(d)		$-\frac{t^3}{3} + t^2 + 3t$	K1	
			$-\frac{(3)^3}{3} + (3)^2 + 3(3) \quad @ \quad \frac{(0)^3}{3} + (0)^2 + 3(0) \quad @ \quad \frac{(6)^3}{3} + (6)^2 + 3(6)$	K1	
			$\left[\left(-\frac{(3)^3}{3} + (3)^2 + 3(3) \right) - (0) \right] + \left[\left(-\frac{(6)^3}{3} + (6)^2 + 3(6) \right) - \left(-\frac{(3)^3}{3} + (3)^2 + 3(3) \right) \right]$	K1	
			36	N1	
					10

LAMPIRAN SOALAN 11



LAMPIRAN SOALAN 14

