

MODUL PINTAS 2024
TINGKATAN 5
MATEMATIK TAMBAHAN
Kertas 2

3472/2

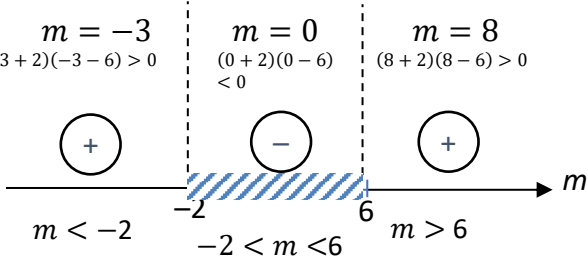
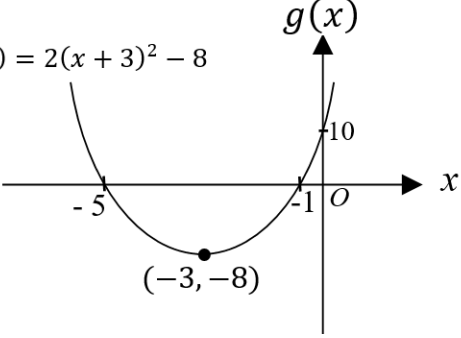
2 jam 30 minit

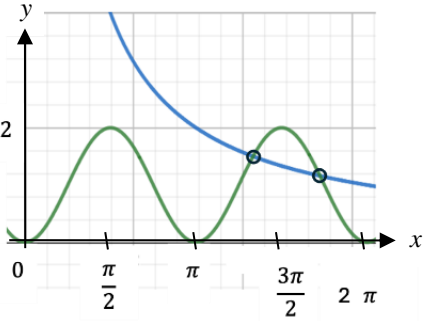
Dua jam tiga puluh minit

PERATURAN PEMARKAHAN
MATEMATIK TAMBAHAN K2

3472/2

NO	JAWAPAN	MARKAH	
BAHAGIAN A			
1	$x^2 + y^2 = 500$ @ $4x + 2y = 100$ $y = 50 - 2x$ $x^2 + (50 - 2x)^2 = 500$ Selesaikan * persamaan kuadratik, $x^2 - 40x + 400 = 0$ $(x - 20)^2 = 0$ @ guna formula @ penyempurnaan kuasa dua $x = 20$ $y = 10$	P1 P1 K1 K1 N1 N1	
		6	
2	$\log_{10} x + 2 \log_{10} y = 2$ @ $3 \log_{10} x - \log_{10} y = 4$ Selesaikan persamaan serentak $7 \log_{10} y = 2$ @ $7 \log_{10} x = 10$ $\log_{10} y = \frac{2}{7}$ @ $\log_{10} x = \frac{10}{7}$ $\log_{10} \sqrt{x} + \log_{10} \sqrt{y}$ @ $\frac{1}{2} \log_{10} xy$ $\frac{1}{2} \left(\frac{10}{7} + \frac{2}{7} \right)$ $\frac{6}{7}$	K1 K1 N1 K1 K1 N1	
		6	
3	a i	$f^{-1}(x)$ wujud kerana $f(x)$ ialah fungsi satu kepada satu. $f^{-1}(x)$ exists because $f(x)$ is a one-to-one function.	P1
	ii	$y^2 = 3x - 5$	K1
		$f^{-1}(x) = \frac{x^2+5}{3}, x \geq 0$	N1
	b i	$g(y) = 2 \left(\frac{1}{y} \right)$ $g(x) = \frac{2}{x}, x \neq 0$	K1 N1

NO	JAWAPAN		MARKAH
	ii	$g^2(x) = \frac{2}{\frac{2}{x}}$ dan $g^3(x) = g(x) = \frac{2}{x}$ dan $g^4(x) = gg(x) = \frac{2}{\frac{2}{x}}$ $2n$ adalah sentiasa genap, $n = 1, 2, 3, \dots$ $g^{2n}(x) = x$. $2n$ is always even, $n = 1, 2, 3, \dots$ $g^{2n}(x) = x$.	K1 N1
			7
4	a	$(m - 2)^2 - 4(1)(4) < 0$ $(m + 2)(m - 6) < 0$ Titik $m = -3$ $m = 0$ $m = 8$ Ujian: $-3 + 2)(-3 - 6) > 0$ $(0 + 2)(0 - 6) < 0$ $(8 + 2)(8 - 6) > 0$  Nota: Terima semua titik ujian yang betul dalam julat yang sepadan $-2 < m < 6$	K1 K1 N1
	b i	$g(x) = 2(x + 3)^2 - 8$  Bentuk \cup Titik minimum $(-3, -8)$, pintasan- $x = -5, -1$ dan pintasan- $y = 10$ dilabel pada graf. Nota: Kedua-dua paksi- x dan paksi- y mesti dilukis dengan pembaris.	P1 N1
	ii	$p < 3$ $q > -8$	P1 P1
			7

NO	JAWAPAN	MARKAH
5	<p>a</p>  <p>Bentuk graf $y = -\cos x$ yang betul</p> <p>2 kitaran dan amplitud yang betul</p> <p>$y = \frac{2\pi}{x}$</p> <p>Garis $y = \frac{2\pi}{x}$ dilakar dengan betul</p> <p>Bilangan penyelesaian= 2</p> <p>b</p> <p>$\frac{1}{\tan x} + 2\cos x = 0$ @ $\frac{\cos x}{\sin x} + 2\cos x = 0$</p> <p>$\cos x (1 + 2\sin x) = 0$</p> <p>Sudut rujukan = $90^\circ, 30^\circ$</p> <p>$90^\circ, 210^\circ, 270^\circ, 330^\circ$</p>	<p>P1</p> <p>P1</p> <p>P1</p> <p>K1</p> <p>N1</p> <p>K1</p> <p>K1</p> <p>N1</p> <p>N1</p> <p>9</p>
6	<p>a</p> <p>$y = \frac{x^3}{3} + 2x + \frac{x^{-1}}{-1} + c$</p> <p>$2 = \frac{1^3}{3} + 2(1) - \frac{1}{1} + c$</p> <p>$y = \frac{x^3}{3} + 2x - \frac{1}{x} + \frac{2}{3}$</p> <p>b</p> <p>$\left[\frac{2x^2}{2} + 3x\right]_0^2$ @ $\frac{1}{2}(3+7)(2)$ @ $\left[\frac{x^4}{4} - \frac{x^3}{3} + 3x\right]_0^2$</p>	<p>K1</p> <p>K1</p> <p>N1</p> <p>K1</p>

NO	JAWAPAN		MARKAH
		$[2^2 + 3(2)] - 0$ @ $\left[\frac{(2)^4}{4} - \frac{(2)^3}{3} + 3(2)\right] - 0$	K1
		$10 - \frac{22}{3}$	K1
		$\frac{8}{3}$	N1
			7
7	a	$\frac{4i+4j}{\sqrt{4^2+4^2}}$	K1
		$\frac{1}{\sqrt{2}}i + \frac{1}{\sqrt{2}}j$	N1
	b	$\vec{QS} = \vec{QP} + \vec{PS}$ @ $\vec{JR} = \vec{JS} + \vec{SR}$ @ $\vec{QK} = \vec{QP} + \vec{PS}$ @ $\vec{KS} = \vec{KJ} + \vec{JS}$	P1
		i. $-20x + 32y$	N1
		ii. $25x$	N1
		iii. $\vec{QS} = \lambda \vec{QK}$	P1
		$-20 = -5\lambda$ dan $32 = 8\lambda$ @ $\vec{QS} = 4(-5x + 8y)$	K1
		$\vec{QS} = 4\vec{QK}$ @ setara dan K, Q dan S adalah segaris.	N1
			8
BAHAGIAN B			
8	a	$\frac{(2x+x^3)(0)-11(2+3x^2)}{(2x+x^3)^2}$ @ $-11(2x+x^3)^{-2}(2+3x^2)$	K1
		$-\frac{11(2+3x^2)}{(2x+x^3)^2}$	N1
	b	$\delta y = 4(x + \delta x)^2 - 4x^2$	K1
		$\frac{dy}{dx} = \lim_{\delta x \rightarrow 0} (8x + 4(\delta x))$ dan $8x + 4(0)$	K1
		$8x$	N1
	c	i	
		$2(x-2)(x) + 1(x-2)^2$	K1
		$y - 1 = -1(x - 1)$	K1
		$y = -x + 2$	N1

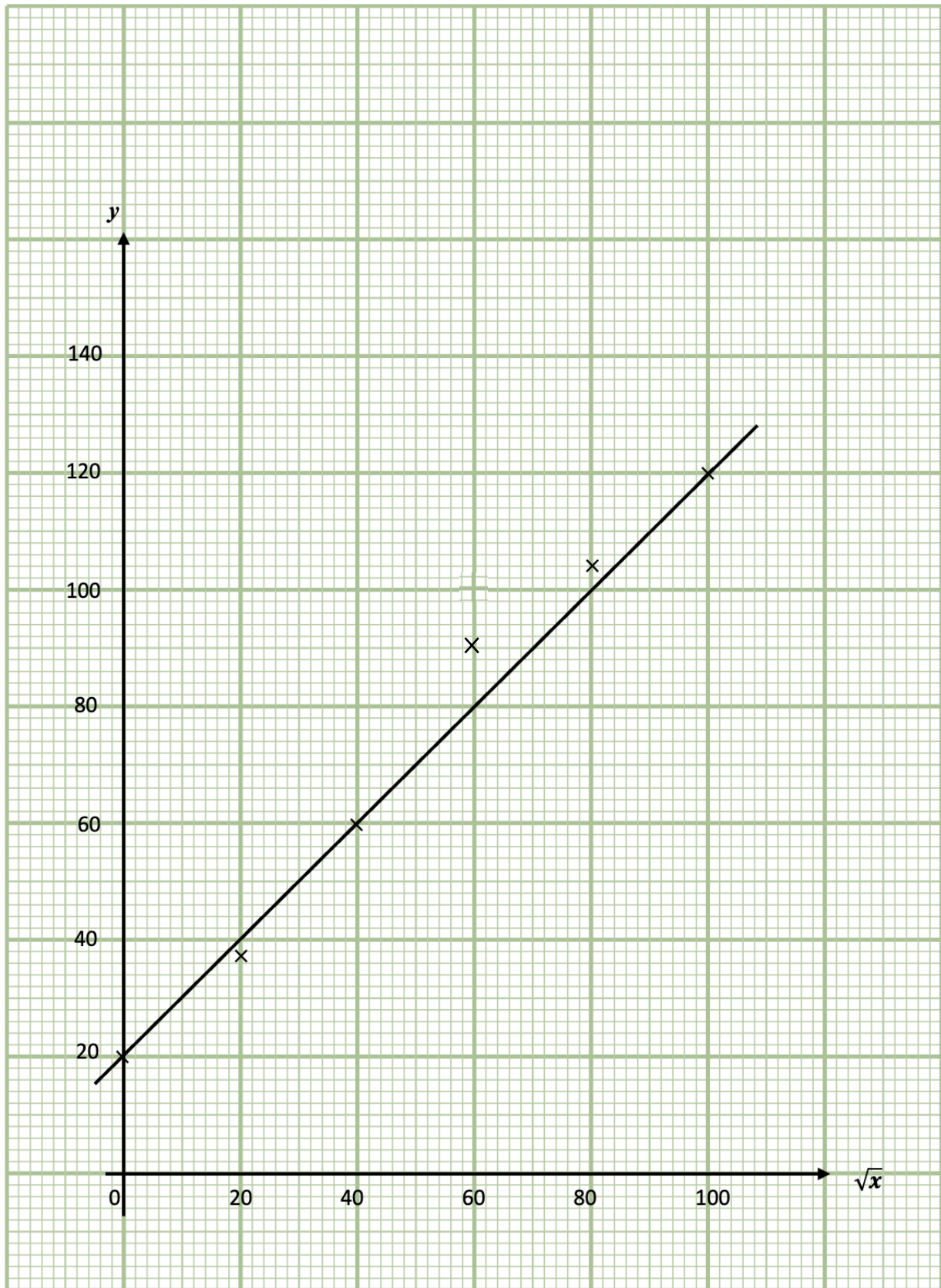
		ii	$-1 \times 1 = -1$, normal	K1 N1										
				10										
9	a	$\sqrt{(x - (-2))^2 + (y - 5)^2} = 4\sqrt{(x - 1)^2 + (y - (-1))^2}$		P1										
		$5x^2 + 5y^2 - 12x + 14y + 1 = 0$		N1										
	b	$h = \frac{1(-2)+3(10)}{1+3} @ -1 = \frac{1(5)+3k}{1+3}$		K1										
		$h = 7 @ k = -3$ $h = 7 \text{ dan } k = -3$		N1 N1										
c	$\frac{1}{2} [(3)(-1) + (1)(t) + (6)(9)] - [(9)(1) + (-1)(6) + (3)(t)] = 28$ $-4,52$		K1 N1											
d	$m_1 = \frac{9-(-1)}{3-1} \text{ dan } 5 \times m_2 = -1$ $y - 2 = -\frac{1}{5}(x - 5)$ $y = -\frac{1}{5}x + 3$		K1 K1 N1											
				10										
10	a	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>\sqrt{x}</td> <td>0</td> <td>20</td> <td>40</td> <td>60</td> <td>80</td> <td>100</td> </tr> </table>					\sqrt{x}	0	20	40	60	80	100	N1
		\sqrt{x}	0	20	40	60	80	100						
	Rujuk pada graf Skala seragam yang betul dan melalui satu titik yang betul Semua titik diplot dengan betul Garis penyuaiian terbaik					K1 N1 N1								
	c	i	$y = 2p\sqrt{x} + q$ $2p = * m @ q = * c$ $p = 0.5 \leftrightarrow 0.52$ $q = 20 \leftrightarrow 20.1$			P1 K1 N1 N1								
ii		$y = 50$			N1									
iii		$y = 80$			N1									
				10										
11	a	i	$P(X = 6) = {}^8C_6 \times (0.1)^6 \times (0.9)^2$ $= 0.00002268$	K1 N1										
		ii	$0.15 > {}^nC_0 \times (0.1)^0 \times (0.9)^{n-0}$ $\log_{10} 0.15 > \log_{10} 0.9^n$ $n=19$	K1 K1 N1										

	b	i	$P\left(Z > \frac{300-210}{35}\right)$ 0.00506	K1 N1
		ii	$P\left(Z > \frac{m-210}{35}\right) = 0.98$ $\frac{m-210}{35} = -2.054$ $m = 138.11$	K1 K1 N1
				10
BAHAGIAN C				
12	a	i	$t^2 - 6t - 7 < 0$ $0 < t < 7$	K1 N1
		ii	$2t - 6 = 0$ $3^2 - 6(3) - 7$ -16	K1 K1 N1
	b		$(t+1)(t-7) = 0$ $t = 7$ $s = \frac{t^3}{3} - \frac{6t^2}{2} - 7t$ $\frac{7^3}{3} - \frac{6(7)^2}{2} - 7(7)$ $81\frac{2}{3}$	K1 N1 K1 K1 N1
				10
13	a		$\frac{y}{180} \times 100 = 105$ @ $\frac{100}{x} \times 258 = 120$ @ $\frac{100}{200} \times 216 = z$ $x = 215$ @ $y = 189$ @ $z = 108$ $x = 215$ dan $y = 189$ dan $z = 108$	K1 N1 N1
	b	i	$\frac{105(5)+120(7)+108(3)}{5+7+3}$ 112.6	K1 N1
		ii	$112.6 = \frac{P}{55} \times 100$ 61.93	K1 N1
	c		$\frac{150 \times 100}{112.6}$ $133.21 = \frac{P}{60.50} \times 100$ 80.59	K1 K1 N1
				10
14	a	i	$5^2 + 9^2 - 2(5)(9) \cos 40^\circ$ 6.087	K1 N1

		ii	$\frac{\sin P}{9} = \frac{\sin 40^\circ}{7.8}$ 47.88°	K1 N1
		iii	$\angle PSR = 92.12^\circ$ (dilihat) $\frac{1}{2} \times 7.8 \times 9 \times \sin 92.12^\circ$ 35.08	P1 K1 N1
	b	Titik <i>P</i> kerana sisi <i>PR</i> bertentang dengan sudut terbesar. <i>Point P because side PR opposite to the largest angle.</i>		N1
	c	$\sin 92.12^\circ = \frac{x}{7.8}$ @ $\frac{1}{2}(9)(x) = 35.08$ 7.795 // 7.796		K1 N1
				10
15	a	i.	$x \geq \frac{1}{3}y$ @ $y \leq 3x$	N1
		ii.	$3x + 2y \leq 1600$	N1
		iii.	$2x + y \geq 600$	N1
	b	<ul style="list-style-type: none"> Lukis dengan betul sekurang-kurangnya satu garis lurus dari *ketaksamaan yang melibatkan x dan y pada paksi-paksi yang bermula dengan asalan. Lukis semua *garis lurus dengan betul dari semua *ketaksamaan yang melibatkan <i>x</i> dan <i>y</i> (terima garisan putus- putus dan garis padu). Rantau dilorek dengan betul. 		K1 N1 N1
	c	i	120	N1
	ii	(300 , 350) @ Dilihat 350 Max Profit = 10(300) + 5(350) = RM4750	N1 K1 N1	
				10

TAMAT

Soalan 10



Soalan 15

