PROGRAM GEMPUR KECEMERLANGAN
SIJIL PELAJARAN MALAYSIA 2022
NEGERI PERLIS

SIJIL PELAJARAN MALAYSIA 2022 3472/2(PP)

MATEMATIK TAMBAHAN

Kertas 2
Peraturan Pemarkahan
November

UNTUK KEGUNAAN PEMERIKSA SAHAJA

Peraturan pemarkahan ini mengandungi 18 halaman bercetak

No.	Solution and Mark Scheme	Sub Marks	Total Marks
1	$10p + 10p + 16p + q = 112$ P1 P1 $16pq + 8p(6p) = 528$ $q = 56 - 18p$ P1 Hapus satu anu (melibatkan satu persamaan linear dan satu persamaan tak linear dalam sebutan p dan q) $p(56 - 18p) + 3p^2 = 33$ K1 Selesaikan persamaan kuadratik K1 $\underline{ax^2 + bx + c = 0 \ for \ b \neq 0}$ Pemfaktoran $(p - 3)(15p - 11) = 0$ Rumus $p = \frac{-(-56) \pm \sqrt{(-56)^2 - 4(15)(33)}}{2(15)}$ N1 $p = 3$ or $p = \frac{11}{15}$ N1 $q = 2$		7

No.	Solution and Mark Scheme	Sub Marks	Total Marks
2 (a)	$a = 8 \quad atau \quad d = 12$ P1 $\frac{n}{2}[2(8) + (n-1)12] = 400$ K1 $(n-8)(3n+2) = 0$ K1 8 N1	4	
(b)	$T_8 = 8 + 7(12)$ K1 92 K1	2	6

No.	Solution and Mark Scheme	Sub Marks	Total Marks
3			
(a)	Tulis hukum segitiga K1 $\overrightarrow{PT} = \overrightarrow{PQ} + \overrightarrow{QT}$ $\frac{15}{4}x + \frac{7}{4}y$ N1 N1 $\frac{-45}{4}x + \frac{7}{4}y$	**3**	
(b)	Guna $\overrightarrow{PU} = \lambda\overrightarrow{PT}$ P1 Samakan pekali x dan y K1 $\frac{45}{4}\lambda = 9$ atau $\frac{7}{4}\lambda = k$ N1 $\lambda = \frac{4}{5}$ N1 $k = \frac{7}{5}$	**4**	**7**

No.	Solution and Mark Scheme	Sub Marks	Total Marks
4			
(a)			
(i)	Guna $kosek^2x = 1 + kot^2x$ (K1) atau $kos\ 2x = 1 - 2sin^2x$ [N1] $Kos\ 2x$	**2**	
(ii)	$kos\ 2x = \frac{-1}{4}$ (K1) Sudut rujukan = 75.52° [N1] $x = 52.24°, 127.76°, 232.24°, 307.76°$ (N1)	**3**	
(b)			
	Graf bentuk kos [P1] 2 kalaan untuk $0 \leq x \leq 2\pi$ [P1] Amplitude 3 [P1]	**3**	**8**

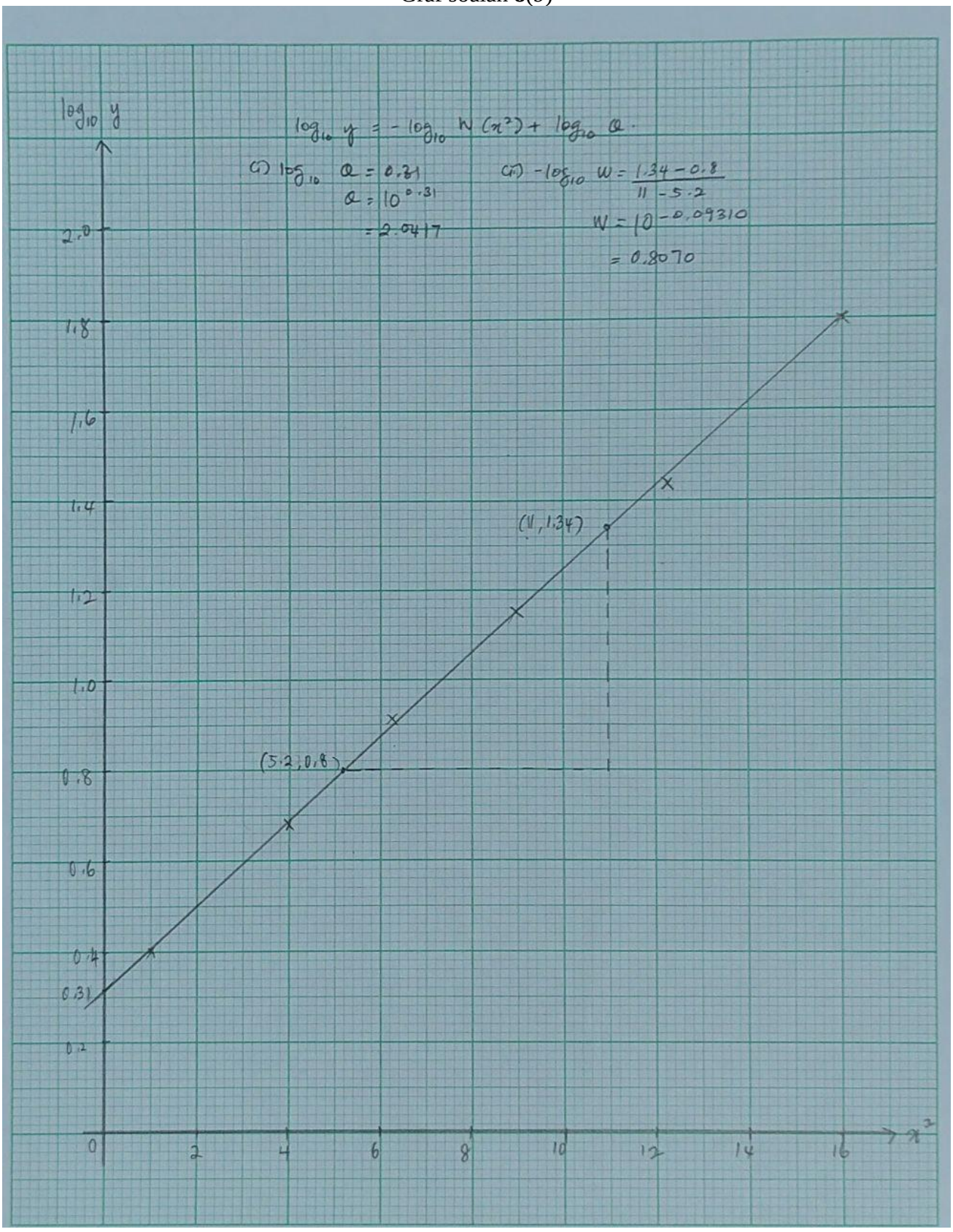
No.	Solution and Mark Scheme	Sub Marks	Total Marks
5	Mencari luas sektor K1 $\frac{1}{2} \times 7^2 \times \frac{\pi}{2}$ Mencari luas segitiga K1 $\frac{1}{2} \times 7 \times 7$ $8\left[\ \frac{1}{2} \times 7^2 \times \frac{\pi}{2} - [\frac{1}{2} \times 7 \times 7]\right]$ K1 $111.88\ cm^2$ N1 111.88×150 K1 $16782\ cm^2$ N1	6	6

No.	Solution and Mark Scheme	Sub Marks	Total Marks
6			
(a)	$f(0) = -(0)^2 + p(0) - 15$ (K1)		
	(0,-15) [N1]	**2**	
(b)	$f(x) = -\left[x^2 - px + \left(\frac{-p}{2}\right)^2 - \left(\frac{-p}{2}\right)^2 + 15\right]$ (K1)		
	$G\left(\frac{p}{2}, \frac{p^2}{4} - 15\right)$ [N1]		
	Bandingkan koordinat-*x* atau koordinat-*y*		
	$\frac{p}{2} = 3$ atau $\frac{p^2}{4} - 15 = h$ (K1)		
	$h = -6$ [N1]	**4**	
(c)	$(-x + 2)(x - 4) > 0$ (K1)		
	$2 < x < 4$ [N1]	**2**	
			8

No.	Solution and Mark Scheme	Sub Marks	Total Marks
7			
(a)	Tukar ke asas 3 K1 $\frac{(3^3)^{m+2n}}{(3^2)^m}$ Menggantikan $3^m = x \ dan \ 3^n = y$ K1 $\frac{x^3 \times y^6}{x^2}$ xy^6 N1	3	
(b)	$\log_3 x = m$ atau $\log_3 y = n$ P1 Guna hukum $log_a \frac{b}{c} = log_a b - log_a c$ K1 $log_{81} 243x - log_{81} y^2$ Guna hukum $Log_a b = \frac{log_c b}{log_c a}$ K1 $\frac{log_3 243x}{log_3 81}$ atau $\frac{log_3 y^2}{log_3 81}$ Guna hukum $log_a b^c = c \ log_a b$ K1 $3log_3 3$ atau $5log_3 3$ N1 $\frac{5+m-2n}{4}$	5	8

No.	Solution and Mark Scheme	Sub Marks	Total Marks
8			
(a)	N1		
	$\log_{10} y$: 0.400, 0.679, 0.914, 1.153, 1.440, 1.800 x^2: 1.00, 4.00, 6.25, 9.00, 12.25, 16.00 N1	2	
	Plot $\log_{10} y$ melawan x (paksi betul dan skala seragam) K1 6 titik diplot dengan betul N1 Garis lurus penyuaian terbaik N1	3	
(b)	$\log_{10} y = -\log_{10} W\,(x^2) + \log_{10} Q$ P1		
(i), (ii)	$Guna\ c = \log_{10} Q$ atau $Guna\ m = -\log_{10} W$ K1 $Q = 2.0417$ $(2.0 \le Q \le 2.1)$ N1 N1 $W = 0.8128$		
(iii)	$y = 17.78$ N1	5	
			10

Graf soalan **8**(*b*)



No.	Solution and Mark Scheme	Sub Marks	Total Marks
9 **(a)**	$x = 2$ atau $y = 10$ P1 dilihat Cari luas trapezium K1 $\frac{1}{2}(4+10)3$ Kamirkan $\int 2x^2 - 8\,dx$ K1 $\left[\frac{2x^3}{3} - 8x\right]$ Ganti had $\int_2^3$ ke dalam $\int 2x^2 - 8\,dx$ K1 $\left(\frac{2(3)^3}{3} - 8(3)\right) - \left(\frac{2(2)^3}{3} - 8(2)\right)$ Luas trapezium – luas dibawah graf K1 $21 - \frac{14}{3}$ N1 $\frac{49}{3}$	**6**	
(b)	$h = 4$ P1 dilihat Kamirkan $\int \pi x^2\,dy$ K1 $\left[\frac{y^2}{4} + 4y\right]$ Guna had $\int_0^4 kedalam$ $\left[\frac{y^2}{4} + 4y\right]$ K1 $\pi\left[\frac{(4)^2}{4} + 4(4) - 0\right]$ N1 20π	**4**	**10**

No.	Solution and Mark Scheme	Sub Marks	Total Marks
10			
(a)	$\frac{y-8}{x-4} = \frac{-2}{3}$ K1		
	N1 $3y = -2x + 32$	**2**	
(b)	$\frac{2(x)+3(0)}{5} = 4$ atau $\frac{2(y)+3(-11)}{5} = -5$ K1		
	N1 R(10,4)	**2**	
(c)	$\frac{1}{2}\|(16 + (-110)) - (80)\|$ K1		
	N1 134	**2**	
(d)			
(i)	$\sqrt{(x-4)^2 + (y-8)^2} = 10$ K1		
	N1 $x^2 + y^2 - 8x - 16y - 20 = 0$	**2**	
(ii)	Ganti $x = 0$ dan guna $b^2 - 4ac$ K1		
	$(-16)^2 - 4(1)(-20) = 336$		
	N1 $b^2 - 4ac > 0$ Memintas paksi-y	**2**	**10**

No.	Solution and Mark Scheme	Sub Marks	Total Marks
11 (a) (i)	$40q = 28$ K1 N1 $p = \frac{3}{10}$	**2**	
(ii)	Guna ${}^{n}C_{r} \times (\frac{3}{10})^{r} \times (\frac{7}{10})^{n-r}$ K1 $P(X \geq 3) = P(X = 3) + P(X = 4) + P(X = 5)$ P1 0.16308 N1	**3**	
(b) (i)	$P\left(Z > \frac{4.5-3.8}{0.7}\right)$ K1 N1 0.1587	**2**	
(ii)	$z = \pm 0.468$ P1 $\frac{m-3.8}{0.7} = 0.468$ K1 N1 $m = 4.1276$	**3**	**10**

No.	Solution and Mark Scheme	Sub Marks	Total Marks
12			
(a)	Bezakan $2t^2 - \frac{1}{3}t^3 + 21t$ K1 $v = 4t - t^2 + 21$ K1 $v = 4(0) - 0^2 + 21$ N1 $v = 21$	3	
(b)	Guna $4 - 2t = 0$ K1 $t = 2$ Ganti $t = 2$ kedalam $4t - t^2 + 21$ K1 $v = 4(2) - 2^2 + 21$ N1 25	3	
(c)	Guna had $\int_0^7 kedalam\ 2t^2 - \frac{1}{3}t^3 + 21t$ K1 $\left[2(7)^2 + \frac{(7)^3}{3} + 21(7)\right] - \left[2(0)^2 + \frac{(0)^3}{3} + 21(0)\right]$ N1 130.67	4	10

No.	Solution and Mark Scheme	Sub Marks	Total Marks
13			
(a)	$120, 110, 125, 115, 125$ N1	**1**	
(b) **(i)**	$p = 5$ P1		
	$\frac{120(70)+110(5)+125(10)+115(5)+125(10)}{70+5+10+5+10}$ K1		
	N1 120.25	**3**	
(ii)	$23320 \times \frac{100}{120.25}$ K1		
	N1 RM 19 392.93	**2**	
(c)			
	$1.50 \times \frac{120.25}{100}$ K1		
	N1 RM 1.80		
	$1.80 - 1.50$ K1		
	N1 RM 0.30	**4**	**10**

[*Lihat halaman sebelah*

No.	Solution and Mark Scheme	Sub Marks	Total Marks
14			
(a)	Guna $AC^2 = 14^2 + 10^2 - 2(14)(10)kos\ 55^\circ$ (K1)		
	N1 11.64	**2**	
(b)	$\frac{Sin\ ADC}{11.64} = \frac{Sin\ 30^\circ}{8.6}$ (K1)		
	N1 42.59˚ , 137.41˚	**2**	
(c)			
(i)	Sudut CAD = 180˚-30˚-42.59˚ P1		
	$\frac{CD}{Sin\ 107.41^\circ} = \frac{8.6}{Sin\ 30^\circ}$ (K1)		
	N1 16.41 cm	**3**	
(ii)	$\frac{1}{2} \times 10 \times 14 \times \sin 55°$ atau $\frac{1}{2} \times 11.64 \times 16.41 \times \sin 30°$ (K1)		
	Luas ABC + Luas ADC (K1)		
	57.34 + 47.75		
	N1 105.09 cm^2	**3**	
			10

No.	Solution and Mark Scheme	Sub Marks	Total Marks
15			
(a)	$x + y \leq 350$ N1 $x \leq 2y$ N1 $y - x \leq 50$ N1	**3**	
(b)	Lukis dengan betul sekurang-kurangnya satu garis lurus dari ketaksamaan yang melibatkan x dan y K1 Lukis dengan betul semua garis lurus N1 Rantau dilorek dengan betul N1	**3**	
(c)	(230,120) N1		
(i)	Ganti mana-mana titik di dalam rantau berlorek dalam prs $50x + 40y$ K1 N1 RM 16300.00		
(ii)	$75 \leq y \leq 200$ N1	**4**	**10**

Graf soalan **15**(*b*)