MAJLIS PENGETUA SEKOLAH MENENGAH MALAYSIA
CAWANGAN NEGERI SEMBILAN DARUL KHUSUS

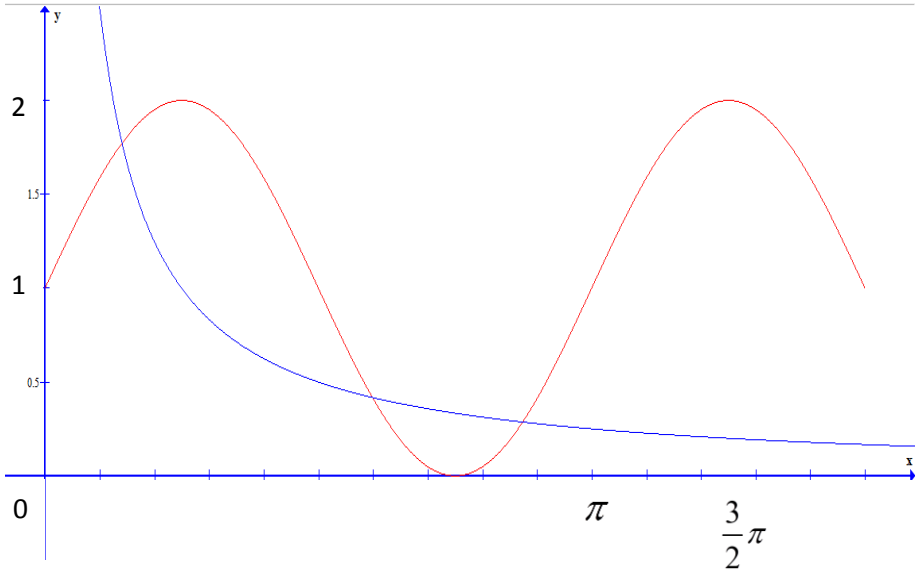
PROGRAM PENINGKATAN AKADEMIK TINGKATAN 5
SEKOLAH-SEKOLAH MENENGAH NEGERI SEMBILAN 2015

PERATURAN PEMARKAHAN

ADDITIONAL MATHEMATICS

PAPER 2

Number	*Solution and marking scheme*	*Sub Marks*	*Full Marks*
1.(a)	Jarak serenjang = $4x$ *cm*	P1	
(b)	$xy+2x^2=5$	P1	
	$8x+y=11$	P1	
	$x(11-8x)+2x^2-5=0$	K1	
	$(x-1)(6x-5)=0$	K1	
	$x=1, x=\frac{5}{6}$	N1	
	$y=3, y=\frac{13}{3}$	N1	**7**
2(a)	$\frac{dy}{dx}=3x^2-3x-6$	K1	
	-6	N1	
(b)	$3x^2-3x-6=0$ *or* $(x-2)(x+1)=0$	K1	
	$Q(-1,\frac{9}{2})$	N1	
	$\frac{d^2y}{dx^2}=6x-3$	K1	
	$=6(-1)-3<0$ Maximum point	N1	**6**
3 (a)	$T_1=S_1=3(1)^2-8(1)$ *or* $T_1=S_1=-5$	K1	
	$d=6$	N1	
(b)	$3(10)^2-8(10)-\left[3(9)^2-8(9)\right]$	K1	
	$T_{10}=49$	N1	
(c)	$3(20)^2-8(20)-\left[3(6)^2-8(6)\right]$	K1	
	980	N1	**6**

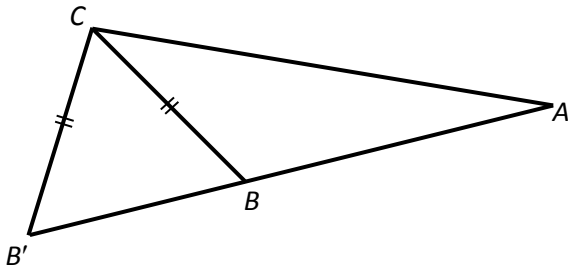
Number	*Solution and marking scheme*	*Sub Marks*	*Full Marks*
4.(a)	$\frac{2}{\sin^2 x+\cos^2 x}\times \sin x\cos x$ $=\sin 2x$	K1 N1	
(b)	 	P1 graf sin 2*x* P1 $0\le\theta\le\frac{3}{2}\pi$ P1 graf sin 2*x* + 1 P1 lukis graf $y=\frac{\pi}{4x}$	
	$y=\frac{\pi}{4x}$	K1	
	Bilangan penyelesaian = 3	N1	**8**
5 (a)	$\frac{1+p+5+q+12}{5}=6$ $p+q=12$	K1 N1	
(b)	$\frac{1+p^2+25+q^2+15^2}{5}-6^2=16$ $p^2+q^2=90$ $(q-9)(q-3)=0$ $q=9,3$ $p=3,9$	K1 K1 K1 selesaikan persamaan serentak N1 kedua-dua	**6**

Number	*Solution and marking scheme*	*Sub Marks*	*Full Marks*
6(a)	$Kecerunan = \frac{4-1}{-1-1} = -\frac{3}{2}$	K1	
	$k = \frac{1}{2}$	N1	
(b)	PR: $2y = 3x - 1$ *or* QR: $2y = x + 9$	K1	
	$x = 5$ $y = 7$	K1 selesaikan persamaan serentak	
	$R(5, 7)$	N1	
(c)	$Luas = \frac{1}{2}\left\|(-7+5+4+1-7-20)\right\|$	K1	
	$= 12$	N1	**7**
7(a)(i)	$n(0.4)(0.6) = 1.44$	K1	
	$n = 6$	N1	
(ii)	[P(X = 5) + P(X = 6)] or [${}^6C_5\ (0.4)^5(0.6)^1 + {}^6C_6\ (0.4)^6(0.6)^0$]	K1	
	0.04096	N1	
(b) (i)	$P\left[\frac{4.8-5.6}{0.7} < Z \leq \frac{6.5-5.6}{0.7}\right]$ or $P[-1.143 < Z \leq 1.286]$ or 1 – 0.12652 – 0.09922	K1	
	0.7743 / 0.7742 0.7743 x 1000		
	774	K1	
		N1	
(ii)	$P\left[Z > \frac{k-5.6}{0.7}\right] = 0.7257$	K1	
	$\frac{k-5.6}{0.7} = -0.60$		
	k = 5.18	K1	
		N1	**10**

Number	*Solution and marking scheme*	*Sub Marks*	*Full Marks*
8 (a)	$x+1$: 1.5, 2.0, 2.5, 3.0, 3.5, 4.0 $\log_{10} y$: 0.36, 0.53, 0.7, 0.86, 1.02, 1.18 *Rujuk graf*	P1 P1	
(b) (i)	$\log_{10} y = (x+1)\log_{10} k - \log_{10} h$ $-\log_{10} h$ = y-intercept = - 0.12 $h = 1.318 \pm 0.05$	P1 K1 N1	
(ii)	$\log_{10} k$ = gradient $k = 2.11 \pm 0.1$	K1 N1	
			10
9(a)	$(1)^2 = 7 - k$ $k = 6$ $0 = x - 6$ $B(6,0)$	P1 K1 N1	
(b)	$Luas = \int_0^1 \left(y^2 + 6\right) dy + \frac{1}{2} \times 7 \times 7$ $= \left[\frac{y^3}{3} + 6y\right]_0^1 + \frac{49}{2}$ $= 30.83$ *or* $= \frac{185}{6}$	K1 K1 N1	
(c)	$Isipadu = \pi \int_6^7 (x-6)dx + \pi \int_7^8 (8-x)^2 dx$ $= \pi \left[\frac{x^2}{2} - 6x\right]_6^7 + \pi \left[-\frac{(8-x)^3}{3}\right]_7^8$ $= \frac{\pi}{2} + \frac{\pi}{3}$ $= \frac{5}{6}\pi$	K1 K1 K1 N1	
			10

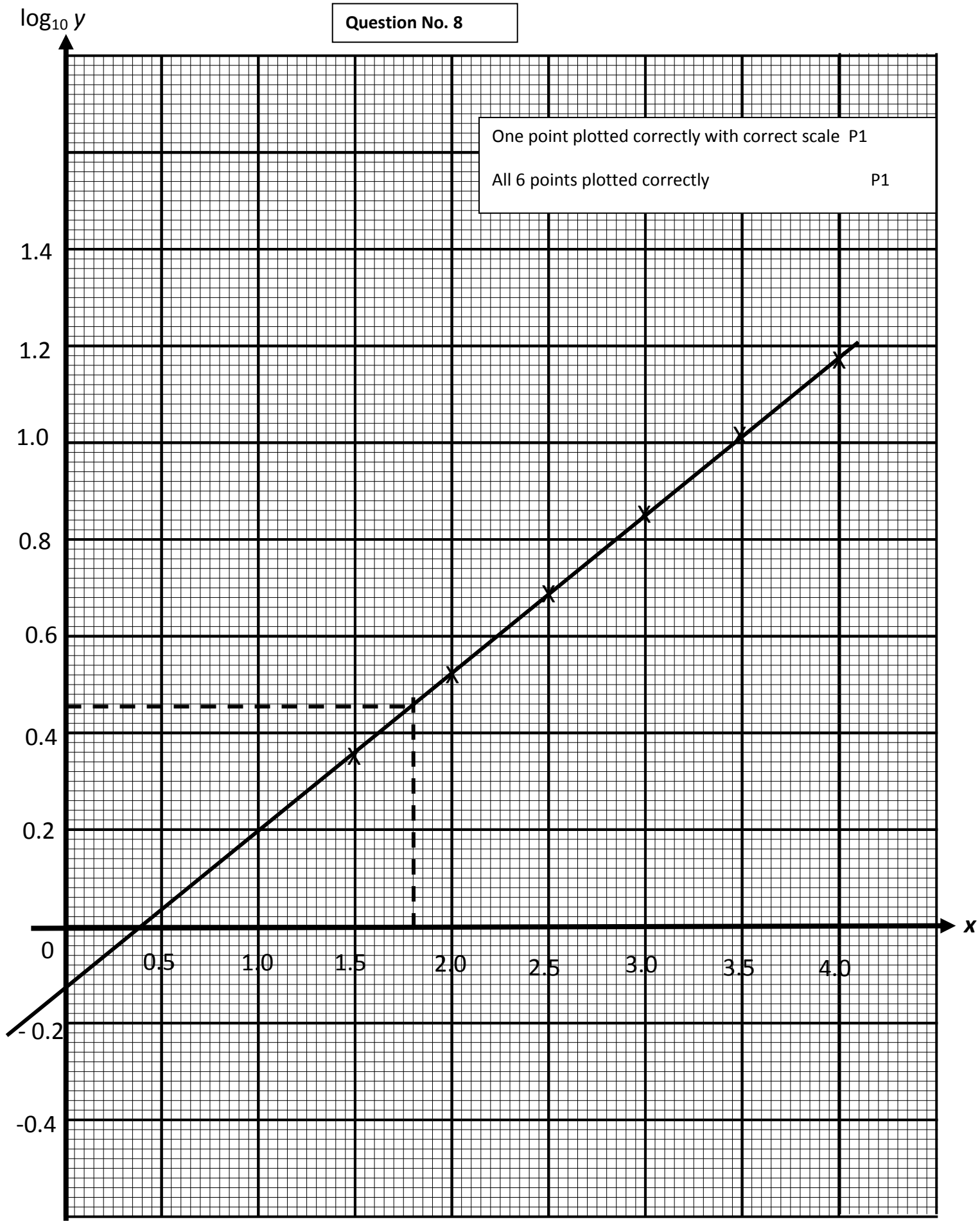
Number	*Solution and marking scheme*	*Sub Marks*	*Full Marks*
10 (a) (i)	$\overrightarrow{BD} = \overrightarrow{BC} + \overrightarrow{CD}$ *or* $\overrightarrow{EC} = \frac{3}{5}\overrightarrow{AB} + \overrightarrow{BC}$ *or* $\overrightarrow{EC} = \frac{2}{5}\overrightarrow{BA} + \overrightarrow{AC}$	K1	
	$\overrightarrow{BD} - 6\underline{y} - 12\underline{x}$	N1	
(ii)	$\overrightarrow{EC} = 9\underline{x} - \frac{12}{5}\underline{y}$	N1	
(b)	$\overrightarrow{CF} = \frac{12}{5}h\underline{y} - 9h\underline{x}$	K1	
	$\overrightarrow{CF} = 6\underline{y} + k(-6\underline{y} - 12\underline{x})$	K1	
	$\frac{12}{5}h = 6 - 6k$ or $-9h = -12k$	K1	
	$k = \frac{15}{23}$ $h = \frac{20}{23}$	N1 N1	
(c)	$\sqrt{45^2 - 12^2}$	K1	
	43.37	N1	
			10
11 (a)	6	N1	
(b)	$\cos \angle QAR = \frac{2}{6}$	K1	
	$\angle PAR$ = 2 x 1.231	K1	
	2.462 rad	N1	
(c)	6(2.462)	K1	
	6 + 6 + 6(2.462)	K1	
	26.77	N1	
(d)	$\frac{1}{2}(6)^2(2.462)$ or $\frac{1}{2}(6)^2 \sin 2.462rad$	K1	
	$\frac{1}{2}(6)^2(2.462) - 2 \times \frac{1}{2}(6)^2 \sin 2.462rad$	K1	
	21.69	N1	
			10

Number	*Solution and marking scheme*	*Sub Marks*	*Full Marks*
12(a)	$t = 6$	P1	
	$a = -2(6) + 4$	K1	
	$a = -8 \text{ m s}^{-2}$	N1	
(b)	$-2t + 4 = 0$ *or* $t = 2$	K1	
	$v = -(2)^2 + 4(2) + 12$	K1	
	$v = 16 \text{ m s}^{-1}$	N1	
(c)	$\int_0^6 (-t^2 + 4t + 12)\,\text{dt}$ *or* $\left\lvert \int_6^9 (-t^2 + 4t + 12)dt \right\rvert$	K1	
	$\left[-\frac{t^3}{3} + 2t^2 + 12t \right]_0^6 + \left\lvert \left[-\frac{t^3}{3} + 2t^2 + 12t \right]_6^9 \right\rvert$	K1	
	$\left[\left(-\frac{6^3}{3} + 2(6)^2 + 12(6) \right) - 0 \right] +$ $\left[\left(-\frac{9^3}{3} + 2(9)^2 + 12(9) \right) - \left(-\frac{6^3}{3} + 2(6)^2 + 12(6) \right) \right]$	K1	
	117m	N1	
			10
13(a)	$\frac{1.20}{x} \times 100 = 150$ or $\frac{2.70}{2.40} \times 100 = y$	K1	
	$x = 0.80$	N1	
	$y = 112.5$	N1	
(b)	*Seen* $\angle S = 40°$ *or in the formula*	P1	
	Composite index= $\frac{(125 \times 152) + (150 \times 90) + (140 \times 78) + (112.5 \times 40)}{360}$	K1	
	Composite index = 133.11	N1	
(c)	$133.11 \times \frac{h}{100} = 149.75$	K1	
	Percentage = 12.5 %	N1	
(d)	$\frac{P_{12}}{35} \times 100 = 149.75$	K1	
	$P_{12} = RM 52.41$	N1	
			10

14 (a)	(i)	$AC^2 = 8{\cdot}7^2 + 12{\cdot}2^2 - 2(8{\cdot}7)(12{\cdot}2)\cos 125$	K1	
		$AC = 18{\cdot}61$ cm	N1	
	(ii)	$\frac{\sin C}{12\cdot 2} = \frac{\sin 125}{18\cdot 61}$	K1	
		$\angle BCA = 32{\cdot}48°$	N1	
		OR		
		$12{\cdot}2^2 = 8{\cdot}7^2 + 18{\cdot}61^2 - 2(8{\cdot}7)(18{\cdot}61)\cos C$	K1	
		$\angle BCA = 32{\cdot}48°$	N1	
(*b*)	(i)		N1	
	(ii)	***Seen*** 55°	P1	
		$\frac{BB'}{\sin 70} = \frac{8\cdot 7}{\sin 55}$	K1	
		$BB' = 9{\cdot}98$ cm	N1	
		Area $= \frac{1}{2}(8{\cdot}7)(9{\cdot}98 + 12{\cdot}2)\sin 55$	K1	
	=	$79{\cdot}03$ cm^2	N1	
		OR		
		Seen 55°	P1	
		$\frac{BB'}{\sin 70} = \frac{8\cdot 7}{\sin 55}$	K1	
		$BB' = 9{\cdot}98$ cm	N1	
		Area $= \frac{1}{2}(18{\cdot}61)(9{\cdot}98 + 12{\cdot}2)\sin 22{\cdot}52$	K1	
		$= 79{\cdot}05$ cm^2	N1	
				10

15(a)	I : $4x+3y \le 240$	N1	
	II : $x+y \ge 30$	N1	
	III : $y-x \ge 10$	N1	
(b)	graph:		
	Axes correct and one straight line correct	K1	
	Three straight lines correct	K1	
	Region R shaded correctly	N1	
(c)(i)	30	N1	
(ii)	Point (0, 30)	P1	
	Minimum cost = 4(0) + 3(30)	K1	
	90	N1	
			10

Question No. 8



Question No. 15