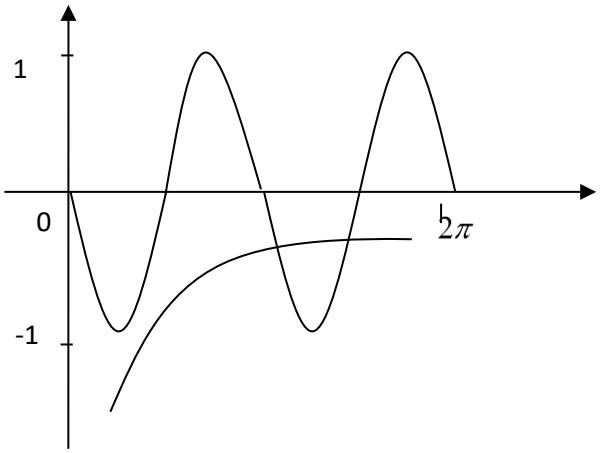
MAJLIS PENGETUA SEKOLAH MALAYSIA
NEGERI SEMBILAN

PROGRAM PENINGKATAN AKADEMIK TINGKATAN 5
SEKOLAH-SEKOLAH MENENGAH NEGERI SEMBILAN 2017

PERATURAN PEMARKAHAN ADDITIONAL MATHEMATICS PAPER 2

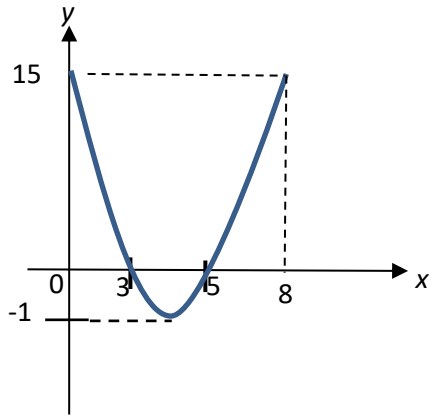
No	Solution and Mark Scheme	Sub Marks	Total Marks
1(a)	69.5	P1	
	$74.5 = 69.5 + \left[\dfrac{\frac{3}{4}(46+h)-(24+h)}{16}\right]10$	K1	
	$h = 10$	N1	
(b)	Melukis sekurang-kurangnya 3 carta bar yang betul.	P1	
	Kaedah mencari mod yang betul.	P1	
	Mod = 67.5	N1	
(c)	71.5	P1	7
2(a)	Menggunakan rumus identiti asas $\sin^2 x + kos^2 x = 1$	K1	
	LHS $= \dfrac{kos^2 x + \sin^2 x}{\sin x kos x}$		
	$= \dfrac{2}{\sin 2x}$ = RHS . Terbukti	N1	
(b)(i)	$y = \sin x$ (bentuk)	P1	
	$y = -\sin 2x$ (2 kala)	P1	
	Amplitud	P1	

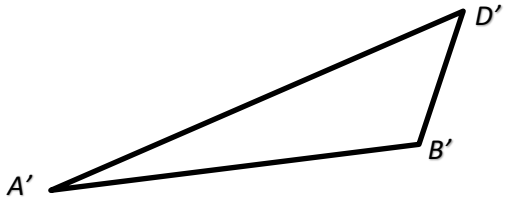
No	Solution and Mark Scheme	Sub Marks	Total Marks
(b)(ii)	$y = -\frac{\pi}{2x}$	K1	
	Melukis $y = -\frac{\pi}{2x}$ 	K1	
	Bilangan penyelesaian = 2	N1	8
3(a)	$\log_4 x = 2^3$	K1	
	$x = y^8$	N1	
(b)(i)	$T = 25(1.8)^{5.9}$		
	= 801.77	N1	
(ii)	$1600 = 25(1.8)^t$	K1	
	$t = 7.075$	N1	5
4(a)	$\frac{12}{2}[2a + 11(-d)] = x$ atau $\frac{20}{2}[2a + 19(-d)] = x + 120$	K1	
	$\frac{20}{2}[2a + 19(-d)] = \frac{12}{2}[2a + 11(-d)] + 120$	K1	
	$a = \frac{31d + 30}{2}$	N1	
(b)	$a = 46$		
	$\frac{12}{2}[2(46) + 11(-2)]$	K1	
	$x = 420$	N1	
	$x + 120 = 540$	N1	6

No	Solution and Mark Scheme	Sub Marks	Total Marks
5	$y-\pi x=15\pi$ atau $xy+\frac{\pi}{2}x^2=3437.5\pi$	P1	
	$y=15\pi+\pi x$	P1	
	$x(15\pi+\pi x)+\frac{\pi}{2}x^2=3437.5\pi$	K1	
	$3x^2+30x-6875=0$		
	$x=\frac{-(30)\pm\sqrt{30^2-4(3)(-6875)}}{2(3)}$	K1	
	$x=43.13$	N1	
	$y=58.13\pi$ or 182.64	N1	6
6(a)(i)	$V=\pi\left(\frac{s}{2\pi}\right)^2(20-s)$	K1	
	$V=\frac{s^2(20-s)}{4\pi}$ Terbukti	N1	
(ii)	$\frac{10s}{\pi}-\frac{3}{4\pi}s^2=0$ atau setara	K1	
	$s=\frac{40}{3}$	N1	
	$t=\frac{20}{3}$	N1	
(b)	$\frac{dV}{dt}=\frac{200\pi}{4}$ or $\frac{dV}{dh}=8$	P1	
	$\frac{200\pi}{4}=\frac{dh}{dt}\times 8$	K1	
	$\frac{dh}{dt}=\frac{25\pi}{4}$	N1	8
7(a)(i)	$np=45$ or $45q=42.3$	K1	
	$q=0.94$	K1	
	$p=0.06$	N1	
(ii)	$0.06n=45$	K1	
	$n=750$	N1	

No	Solution and Mark Scheme	Sub Marks	Total Marks
7(b)(i)	$P\left(Z \geq \frac{49-46}{6.5}\right)$ or $P\left(Z \geq \frac{49-46}{\sqrt{42.25}}\right)$ or P(Z > 0.4615)	K1	
	0.3222	N1	
(ii)	$P\left(Z < \frac{m-46}{6.5}\right) = 0.178$	K1	
	$\frac{m-46}{6.5} = -0.923$	K1	
	40	N1	10
8(a)	$y = \int 2x dx$		
	$y = \frac{2x^2}{2} + c$	K1	
	$c = -16$ or $-12 = 4^2 + C$	K1	
	$y = x^2 - 16$	N1	
(b)(i)	$\frac{1}{2}(20)\left(\frac{20}{4}\right)$ $atau$ $\left\|\int_0^4 (x^2 - 16)\, dx\right\|$	K1	
	$\frac{1}{2}(20)\left(\frac{20}{4}\right) - \left\|\left[\frac{x^3}{3} - 16x\right]_0^4\right\|$	K1	
	$50 - \frac{128}{3}$		
	$\frac{22}{3}$ or 7.3333 or $7\frac{1}{3}$	N1	
(ii)	$\pi \int_{-16}^{0} (y + 16)\, dy$	K1	
	$\pi \left[\frac{y^2}{2} + 16y\right]_{-16}^{0}$	K1	
	$\pi \left[\left[\frac{0^2}{2} + 16(0)\right] - \left[\frac{(-16)^2}{2} + 16(-16)\right]\right]$	K1	
	128π	N1	10

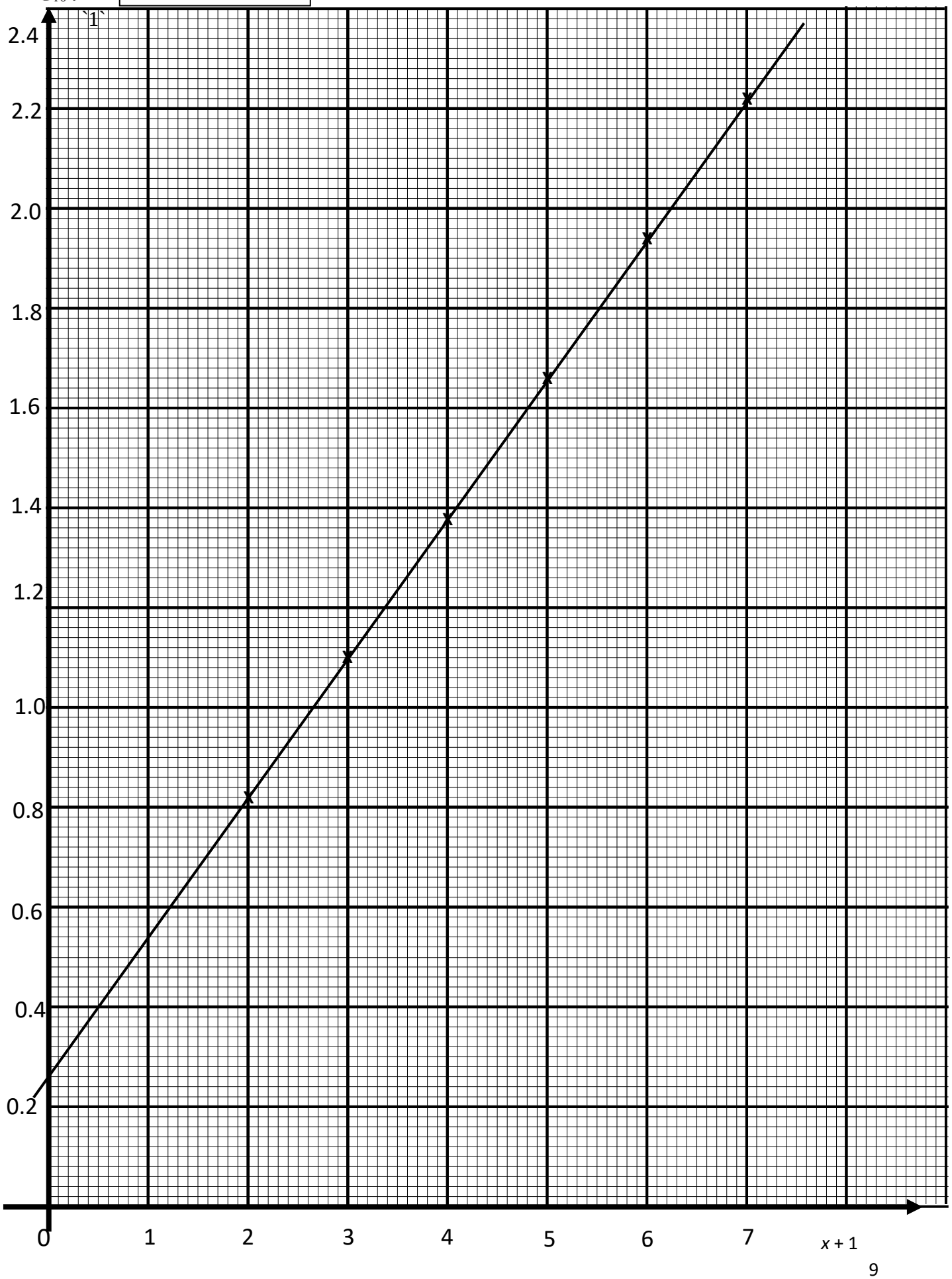
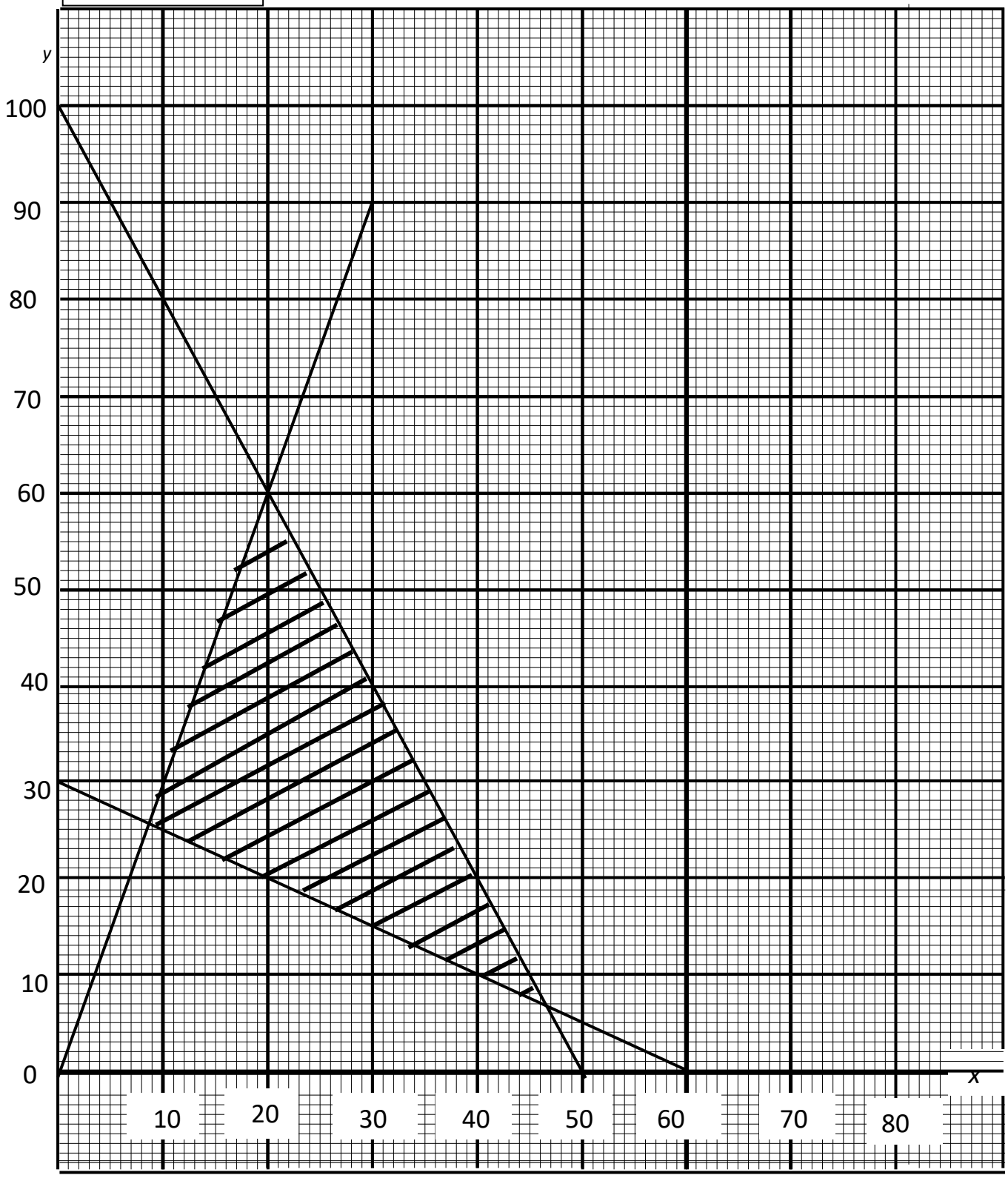
No	Solution and Mark Scheme	Sub Marks	Total Marks
9(a)(i)	$\sqrt{(m-1)^2+8^2}=10$	K1	
	7	N1	
(ii)	$\overrightarrow{BD}=\overrightarrow{BA}+\overrightarrow{AD}$ or $\overrightarrow{BD}=\overrightarrow{BC}+\overrightarrow{CD}$ or $-6\underline{i}-8\underline{j}+3\underline{i}+4\underline{j}$	K1	
	$-3\underline{i}-4\underline{j}$	N1	
(b)	$\frac{1}{3}\overrightarrow{BA}+\frac{3}{4}\overrightarrow{AD}$ or $\frac{1}{3}\left(-6\underset{\sim}{i}-8\underset{\sim}{j}\right)+\frac{3}{4}\left(3\underset{\sim}{i}+4\underset{\sim}{j}\right)$	K1	
	$\frac{1}{4}\underset{\sim}{i}+\frac{1}{3}\underset{\sim}{j}$	N1	
(c)(i)	$\overrightarrow{BT}=\overrightarrow{BA}+\overrightarrow{AT}$ or $-6i-8j+\frac{9}{5}\underset{\sim}{i}+\frac{12}{5}\underset{\sim}{j}$ or $\underset{\sim}{-3i-4j}$	K1	
	$-\frac{21}{5}\underset{\sim}{i}-\frac{28}{5}\underset{\sim}{j}$	N1	
(ii)	$\overrightarrow{BT}=\frac{7}{5}\left(-3\underset{\sim}{i}-4\underset{\sim}{j}\right)$ or $\overrightarrow{BT}=\frac{7}{5}\overrightarrow{BD}$ or	K1	
	BT adalah selari dengan BD. B adalah titik sepunya. Maka titik-titik B, D, T adalah segaris,	N1	10
10(a)	120^o	P1	
	$\frac{2}{3}\pi$ or 2.095	N1	
(b)	$2(3.142)-2.095$	P1	
	$10[2(3.142)-2.095]$	K1	
	$2(10)[2(3.142)-2.095]$	K1	
	83.78	N1	
(c)	Luas sektor $RBS = \frac{1}{2}(10)^2(2.095)$ atau		
	Luas segitiga $RBS = \frac{1}{2}(10)^2\sin 2.095rad$ atau		
	Luas tembereng $RBS = \frac{1}{2}(10)^2(2.095-\sin 2.095rad)$	K1	
	$3.142(10)^2-[\frac{1}{2}(10)^2(2.095)-\frac{1}{2}(10)^2\sin 2.095rad]$	K1	
	$2[3.142(10)^2-[\frac{1}{2}(10)^2(2.095)-\frac{1}{2}(10)^2\sin 2.095rad]]$	K1	
	505.47	N1	10

No	Solution and Mark Scheme	Sub Marks	Total Marks
11(a)	$x+1$: 2, 3, 4, 5, 6, 7	P1	
	$\log_{10} y$: 0.8202, 1.100, 1.380, 1.660, 1.940, 2.220	P1	
(b)	Kedua paksi dengan skala betul dan satu titik diplot betul.	P1	
	Semua titik diplot dengan betul.	P1	
	Garis penyuaian terbaik. (melalui min 3 titik dan seimbang)	P1	
(c)(i)	$\log_{10} y = \log_{10} p - (x+1)\log_{10} k$	P1	
	$-\log_{10} k = \dfrac{1.66-0.26}{5-0}$ atau setara	K1	
	0.5248	N1	
(ii)	$\log_{10} p =$ y-pintasan or $\log_{10} p = 0.26$	K1	
	1.820	N1	10
12(a)	$v = \int 2t - 8\ dt$	K1	
	$v = t^2 - 8t + 15$		
	$a = 2t - 8 = 0$	K1	
	$t = 4$		
	Halaju$_{min}$ = $(4)^2 - 8(4) + 15$		
	$= -1\ ms^{-1}$	N1	
	$t^2 - 8t + 15 > 0$	K1	
(b)	$(t-3)(t-5) > 0$		
	$0 \le t < 3$, $t > 5$	N1	
(c)	 Bentuk graf	N1	
	(0,15) , (8, 15)	N1	
(d)	$\left[\dfrac{t^3}{3} - 4t^2 + 15t\right]_2^3$	K1	
	$\left[\dfrac{3^3}{3} - 4(3)^2 + 15(3)\right]$ - $\left[\dfrac{2^3}{3} - 4(2)^2 + 15(2)\right]$	K1	
	Jarak dalam saat ketiga $= \dfrac{4}{3}$	N1	10

No	Solution and Mark Scheme	Sub Marks	Total Marks
13(a) (i)	$\frac{BD}{\sin 86} = \frac{11}{\sin 54}$	K1	
	$BD = 13.56$ cm	N1	
(ii)	$17^2 = 20^2 + 13.56^2 - 2(20)(13.56)\cos D$	K1	
	$\angle ADB = 57.07^0$	N1	
(b)			
	(sudut *B'* adalah sudut cakah)	N1	
(c)	$BE = \sqrt{17^2 + 12^2}$ or $DE \sqrt{20^2 + 12^2}$ $= 20.81$ $= 23.32$	K1	
	$13.56^2 = 23.32^2 + 20.81^2 - 2(23.32)(20.81)\cos \angle BED$	K1	
	$\angle BED = 35.21^0$	N1	
	$\frac{1}{2}(23.32)(20.81)\sin 35.21$	K1	
	139.90 cm^2	N1	10
14 (a)	$40x + 20y \leq 2000$ atau setara	N1	
	$30x + 60y \geq 1800$ atau setara	N1	
	$y \leq 3x$ atau setara	N1	
(b)	Melukis dengan betul sekurang-kurangnya satu garis lurus. Melukis dengan betul semua garis lurus. Melorek kawasan yang betul	K1 N1 N1	
(c)(i)	Bilangan minimum = 15	N1	
(ii)	(20, 60) Untung = RM300 (20) + RM250 (60) = RM21 000	N1 K1 N1	10

No	Solution and Mark Scheme	Sub Marks	Total Marks
15 (a)(i)	$\frac{2}{P_{2013}} \times 100 = 189$ (guna formula **dan** samakan dengan 189)	K1	
	P_{2013} = RM1.06	N1	
(ii)	$\frac{Q_{2013}}{Q_{2015}} \times 100 = 184$ or $\frac{Q_{2014}}{Q_{2013}} \times 100 = 84$	K1	
	$= \frac{84}{100} \times \frac{184}{100} \times 100$	K1	
	= 154.56	N1	
(b)(i)	$\frac{(84\times5)+(154\times40)+(189\times10)+45p}{5+40+10+45}$	K1	
	$\frac{(84\times5)+(154\times40)+(189\times10)+45p}{5+40+10+45} = 154$ (samakan dengan 154)	K1	
	p = 154	N1	
(ii)	$\frac{27.10}{P_{2013}} \times 100 = 154$	K1	**10**
	P_{2013} = RM17.60	N1	

Question No. 11



Question No. 14