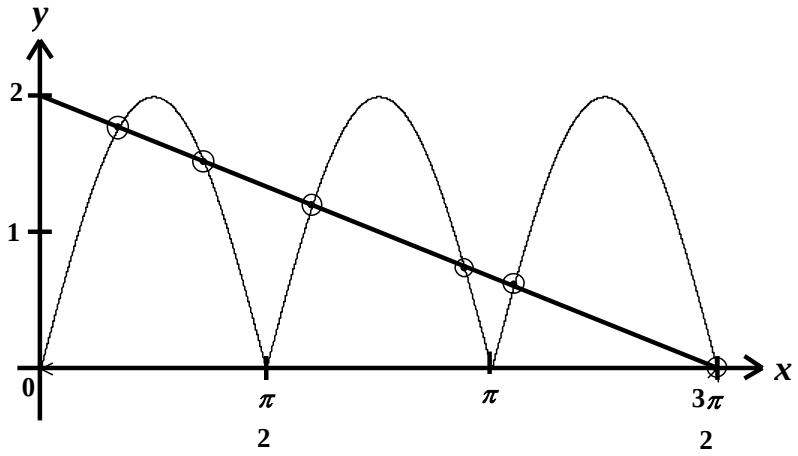
NO	SOLUTION	SUB MARK	TOTAL MARK
1.	$y = 2-3x$ OR $x = \frac{2-y}{3}$	1m	
	$x^2 + 2(2-3x)^2 + x(2-3x) = 4$ OR $\left(\frac{2-y}{3}\right)^2 + 2y^2 + y\left(\frac{2-y}{3}\right) = 4$	1m	
	$16x^2 - 22x + 4 = 0$: $x = \frac{-(-22) \pm \sqrt{(-22)^2 - 4(16)(4)}}{2(16)}$ OR $16y^2 + 2y - 32 = 0$: $y = \frac{-(2) \pm \sqrt{(2) - 4(16)(-32)}}{2(16)}$	1m	
	$x = 0.216$ $x = 1.159$	1m	
	$y = -1.477 // -1.478$ $y = 1.352 // 1.353$	1m	
			5 marks
2. (a)	$\frac{dy}{dx} = 8x + 5$ and sub $x = -1$	1m	
	-3	1m	
(b)	$\delta x = 0.01$ and use $\delta y = \frac{dy}{dx}\delta x$	1m	
	-0.03	1m	
(c)	Use $\frac{dy}{dx} = 0$, $8x + 5 = 0$	1m	
	$\left(-\frac{5}{8}, -\frac{25}{16}\right)$	1m	
			6 marks

3. (a)	$A_1 = hk \;\; or \;\; A_2 = \frac{hk}{4} \;\; or \;\; A_3 = \frac{hk}{16}$	1m	
	$r = \frac{1}{4}$	1m	
	$\frac{a\left(1-\left(\frac{1}{4}\right)^4\right)}{1-\frac{1}{4}} = 510$	1m	
	$a = 384$	1m	
(b)	$384\left(\frac{1}{4}\right)^{n-1} = 96 \;\; or \;\; T_2 = 384\left(\frac{1}{4}\right)$	1m	
	$n = 2$	1m	
(c)	$S_\infty = \frac{384}{1-\frac{1}{4}}$	1m	
	$S_\infty = 512$	1m	8 marks
4.(a)	Midpoint		
	Gred A $= \frac{4.0+4.9}{2}$ or Gred E $= \frac{0+0.9}{2}$	1m	
	4 kg	1m	
(b)	Let Gred E $= x$ and Gred B $= y$		
	$\frac{0.45(x)+1.45(5)+2.45(5)+3.45(y)+4.45(6)}{30} = 2.65$ $0.45x + 3.45y = 33.3$	1m	
	$30 = x+5+5+y+6$ $x + y = 14$	1m	
	Solve the eqn $0.45x + 3.45y = 33.3$ and $x + y = 14$	1m	
	$x = 5$ and $y = 9$	1m	
(c)	2.65 kg	1m	7 marks

5(a) (b)	 Shape of sin Cycle Amplitude Modulus $y = 2 - \frac{4x}{3\pi}$ Draw a straight line $y = 2 - \frac{4x}{3\pi}$ No of solution = 6	1m 1m 1m 1m 1m 1m 1m	7 marks
6(a) (b) (c)	$\frac{x+3}{2} = 0$ or $\frac{y+4}{2} = 0$ $A(-3,-4)$ $m_{AC} = \frac{4-0}{3-0}$ $m_{BD} = \frac{-1}{m_{AC}}$, $m_{BD} = -\frac{3}{4}$ $y = -\frac{3}{4}x$ $\sqrt{(x-3)^2 + (y-4)^2} = 5$ $x^2 + y^2 - 6x - 8y = 0$	1m 1m 1m 1m 1m 1m 1m	7 marks

7(a) (i) (ii)	$\overrightarrow{OX} = \overrightarrow{OA} + \overrightarrow{AX}$ or $\overrightarrow{BY} = \overrightarrow{BO} + \overrightarrow{OY}$	1m	
	$\overrightarrow{OX} = \frac{16}{5}\underset{\sim}{a} + \frac{3}{5}\underset{\sim}{b}$	1m	
	$\overrightarrow{BY} = \frac{32}{5}\underset{\sim}{a} - \frac{9}{5}\underset{\sim}{b}$	1m	
(b)	$\overrightarrow{OC} = 4h\underset{\sim}{a}$	1m	
	$\overrightarrow{BC} = \frac{32}{5}k\underset{\sim}{a} - \frac{9}{5}k\underset{\sim}{b}$	1m	
	Use $\overrightarrow{OC} = \overrightarrow{OB} + \overrightarrow{BC}$ and compare $4h = \frac{32}{5}k$ or $-3 = -\frac{9}{5}k$	1m	
	$k = \frac{5}{3}$	1m	
	$4h = \frac{32}{5}\left(\frac{5}{3}\right)$	1m	
	$h = \frac{8}{3}$	1m	
(c)	14.42	1m	10 marks

8(a)	$10^2 = 5^2 + 14^2 - 2(5)(14)\cos\theta$	1m	
	$\theta = 0.5272$ rad	1m	
(b)	$\cap AB = 14(0.5272)$	1m	
	$CB = 14 - 5$	1m	
	Perimeter = $= (14-5) + 10 + 14(0.5272)$	1m	
	26. 38	1m	
(c)	Area of sector AOB $= \frac{1}{2}(14)^2(0.5272)$	1m	
	Area of $\Delta AOC = \frac{1}{2}(5)(14)\sin(30.20°)$	1m	
	Area of shaded region $= \frac{1}{2}(14)^2(0.5272) - \frac{1}{2}(5)(14)\sin(30.20°)$	1m	
	34.06	1m	10 marks
9(a)			
	xy | 6 | 7.8 | 12 | 14 | 16.5 | 20	1m	
	Plot 1 point correctly	1m	
	Plot all point correctly	1m	
	Draw a line best fit	1m	
(b) (i) (ii)	$xy = \frac{a}{2}(x) + \frac{b}{2}$	1m	
	Use $\frac{a}{2} = m$	1m	
	$a = 4$	1m	
	Use $\frac{b}{2} = 4$	1m	
	$b = 8$	1m	
(iii)	$y = 3.56$	1m	10 marks

10(a) (i)	$20p(1-p)=4.8$	1m	
	$25p^2-25p+6=0$		
	$(5p-3)(5p-2)=0$	1m	
	$p=\frac{3}{5}, p>q$	1m	
(ii)	$P(X=13)={}^{20}C_{13}\left(\frac{3}{5}\right)^{13}\left(\frac{2}{5}\right)^{7}$	1m	
	0.1659	1m	
(b) (i)	$P\left(Z>\frac{50-45}{6}\right)$	1m	
	0.2025	1m	
(ii)	$P\left(\frac{50-45}{6}<Z<\frac{60-45}{6}\right)$	1m	
	$P(Z>0.833)-P(Z>2.5)$	1m	
	0.1965		
	Number of residents = 11775	1m	10 marks
11(a)	Find Point Q, $(0,2)$	1m	
	$m_{PQ}=\frac{2-0}{0-4}$	1m	
	$y=-\frac{1}{2}x+2$	1m	
(b)		1m	

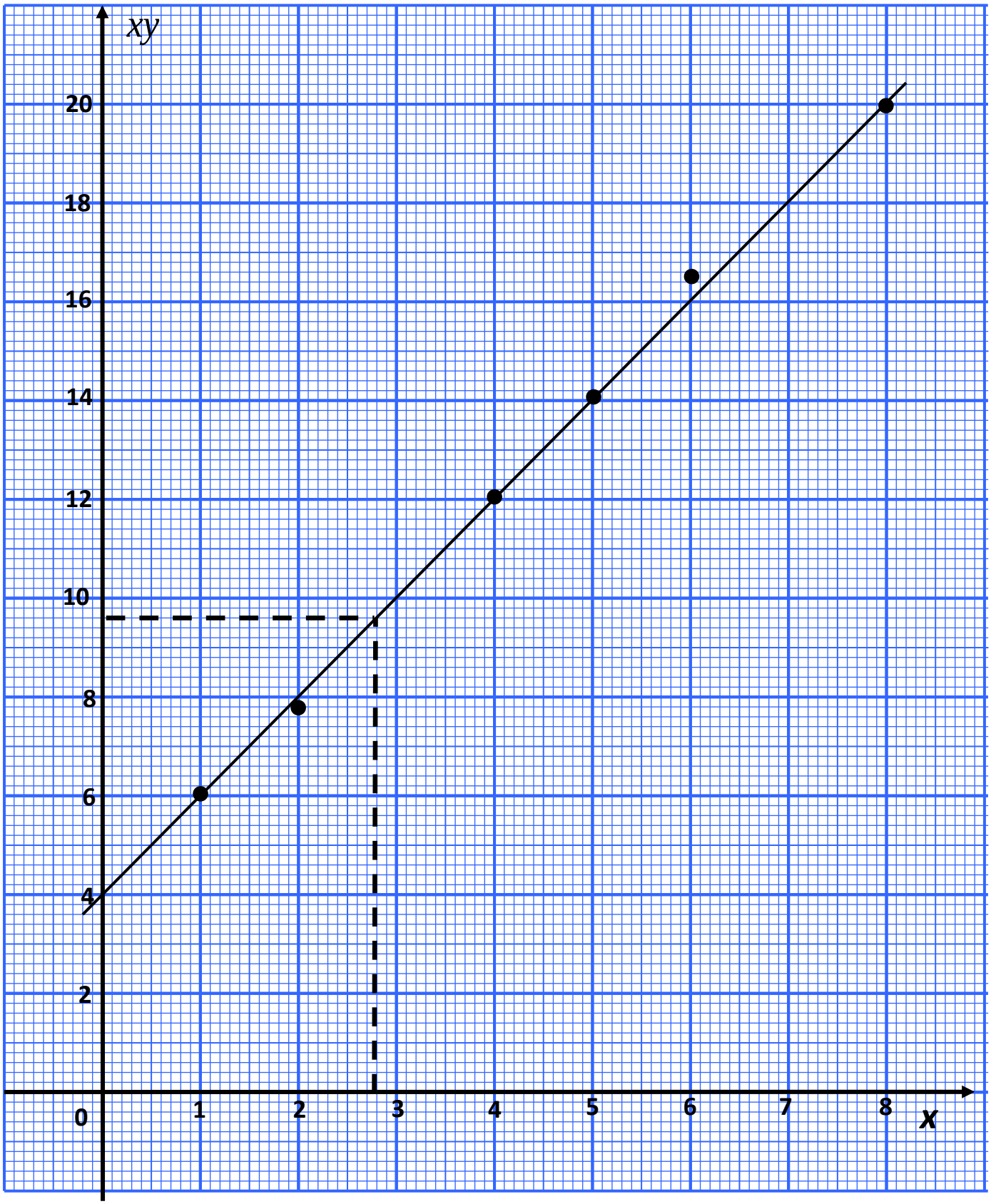
	Area $\Delta OPQ = \frac{1}{2}(2)(4)$		
	Integrate $\int_0^2 \left(y^2 - 4\right) dy$ or $\int_{-4}^0 (x+4)^{\frac{1}{2}}\, dx$	1m	
	$\left\|\left[\frac{y3}{3} - 4y\right]_0^2\right| + \frac{1}{2}(2)(4)$ or $\left\|\left[\frac{(x+4)^{\frac{3}{2}}}{\frac{3}{2}}\right]_{-4}^0\right| + \frac{1}{2}(2)(4)$	1m	
	$\frac{28}{3}$	1m	
(c)		1m	
	Integrate $\pi\int_0^4 (x+4) dx$	1m	
	Sub limit $\pi\left[\left(\frac{4^2}{2} + 4(4)\right) - \left(\frac{0^2}{2} + 4(0)\right)\right]$	1m	
	24π		10 marks
12(a)	$\frac{\sin \angle ADC}{15} = \frac{\sin 72°}{8 + 6.5}$	1m	
	$\angle ADC = 79.69°$	1m	
(b)	$EF^2 = 7^2 + 6.5^2 - 2(7)(6.5)\cos 79.69°$	1m	
	$EF = 8.658$	1m	
(c)	$\angle ACD = 180° - 72° - 79.69°$	1m	
	$\cos 25.31° = \frac{BC}{8}$	1m	
	$AB = 7.760$	1m	
(d)	$\Delta ADC = \frac{1}{2}(15)(14.5)\sin 25.31°$ or $\Delta EDF = \frac{1}{2}(7)(6.5)\sin 79.69°$	1m	
	0r $\Delta BFC = \frac{1}{2}(7.232)(8)\sin 25.31°$		
	Area AEFB = $\Delta ADC - \Delta EDF - \Delta BFC$	1m	
	11.74	1m	10 marks

13(a)	$\frac{x}{230}\times 100 = 200$ or $\frac{240}{160}\times 100 = y$	1m	
	$x = 460$	1m	
	$y = 150$	1m	
(b)(i)	Use index composite $\frac{130(60)+200(z)+150(10)+150(10)}{60+z+10+10}$	1m	
	$\frac{130(60)+200(z)+150(10)+150(10)}{60+z+10+10} = 148$	1m	
	$z = 20$	1m	
(ii)	$\frac{P_{08}}{20}\times 100 = 148$	1m	
	$P_{08} =$ RM 29.60	1m	
(c)	$\frac{150}{100} = \frac{I_{10/04}}{70}$	1m	
	$I_{10/04} = 105$	1m	10 marks
14(a)	$I : x + y \le 80$ $II : y - x \le 20$ $III : x \le 3y$	1m 1m 1m	
(b)	Draw 1 line correctly Draw all line correctly Shaded region R	1m 1m 1m	
(c)(i)	15	1m	
(ii)	Point $(60, 20)$ Kos $= 30(60)+25(20)$	1m 1m	
	2300	1m	10 marks

15(a)	8	1m	
(b)	$a = 2 - 2t$	1m	
	$t = 1$	1m	
(c)	$S = 8t - t^2 - \frac{t^3}{3}$	1m	
	$v = 0, \quad t^2 - 2t - 8 = 0$	1m	
	$(t-4)(t+2) = 0$	1m	
	$t = 4$	1m	
	$S_4 = 8(4) + (4)^2 - \frac{(4)^3}{3}$	1m	
	$26\frac{2}{3}$	1m	
(d)	$S_5 = 8(5) + (5)^2 - \frac{(5)^3}{3}$	1m	
	Jumlah jarak $= S_4 + (S_4 - S_5)$	1m	
	30 m	1m	10 marks

Soalan 5(b)

Soalan 9



Soalan 14