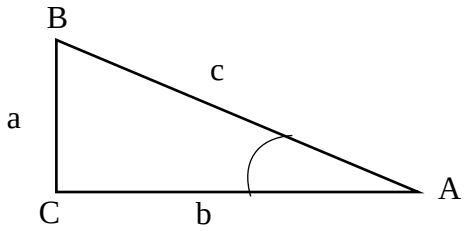
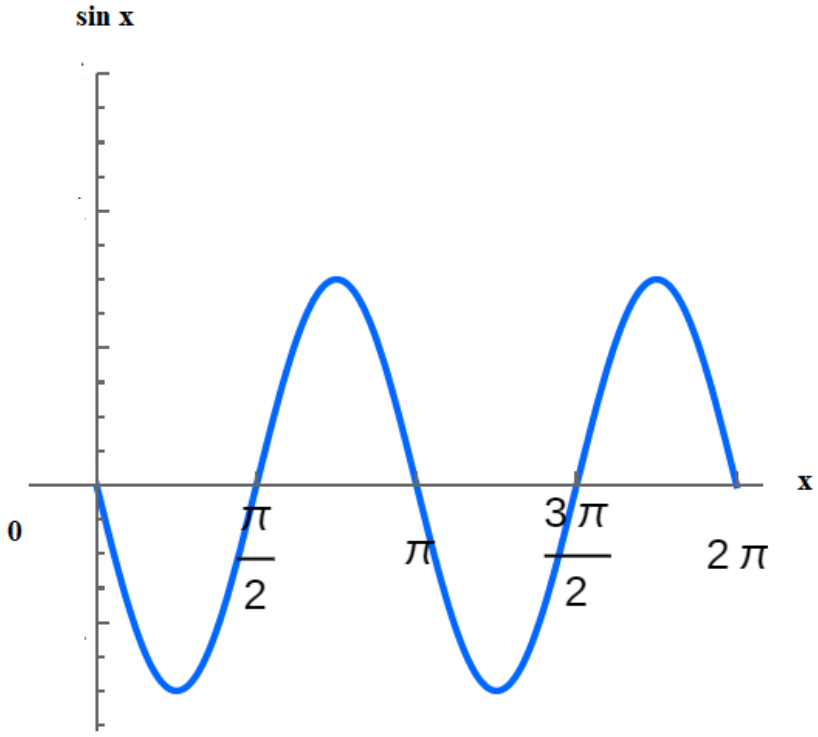
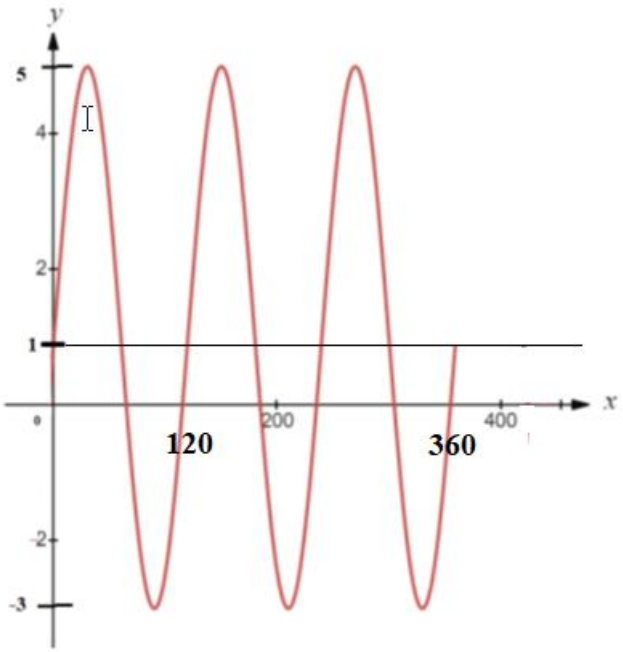
No.	Penyelesaian	Sub Markah	Jumlah
1	$x + y + z = 250$ ①		
	$15x + 10y + 8z = 2\,825$ ②	1	
	$y = 2x$ ③		
	Gantikan ③ ke dalam ①		
	$3x + z = 250$ ④	1	
	Gantikan ③ ke dalam ②		
	$35x + 8z = 2\,825$ ⑤		
	④ × 8: $24x + 8z = 2\,000$ ⑥		
	⑤ – ⑥: $11x = 825$	1	
	$x = 75$	1	
	Gantikan x = 75 ke dalam ③		
	y = 150	1	
	Gantikan x = 75 ke dalam ④		
	$z = 25$	1	
	Dewasa: 75, Pelajar: 150, Kanak-kanak: 25 (semua betul)	1	**7**
2	(a) Katakan $l = lebar$, *terima sebarang algebra bagi lebar.		
	$l \times (2 - \sqrt{2}) = 3 + \sqrt{2}$	1	
	$l = \frac{3 + \sqrt{2}}{2 - \sqrt{2}} \times \frac{2 + \sqrt{2}}{2 + \sqrt{2}}$	1	
	$= \frac{6 + 3\sqrt{2} + 2\sqrt{2} + 2}{4 - 2}$	1	
	$= 4 + \frac{5}{2}\sqrt{2}$	1	4
	(b)		
	$log_7 (x - 1) - log_7 (x - 7) = 1$		
	$log_7 \frac{(x - 1)}{(x - 7)} = 1$	1	
	$x = 8$	1	**2**

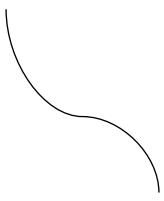
No.	Penyelesaian	Sub Markah	Jumlah
3	(a) Untuk Syarikat X: a = 45 500 dan d = 500 Untuk syarikat Y: a = 40300 dan r =1.07 Maka, skim penggajian syarikat Y yang mengikut suatu janjang geometri.	1 1 1	3
	(b)Untuk syarikat X: $T_5 = 45\ 500 + (5-1)(500)$ = 47 500 Untuk syarikat Y: $T_5 = 40300(1.07)^{5-1}$ = 52825.08	1 1	2
	(c) Untuk syarikat Y: T 1 2 3 4 5 6 7 8 9 gaji tahunan ke-n 40300 43121 46139.47 49369.23 52825.08 56522.83 60479.43 64712.99 69242.9 740 5605.73 5998.131 9001.57 15% 5239 6418 6867.26 7347.969 7862.326 8412.689 7 963 Jumlah untuk 10 tahun = 5239 + 5605.73 + 5998.131 + 6418 + 6867.26 + 7347.969 + 7862.326 + 8412.689 + 9001.577 + 9631.688 = 72384.37 ATAU $a = 40300, r = 1.07, S_{10}$ $S_n = \frac{40300(1.07^{10-1})}{1.07-1}$ S_n =556802.8528 13% disimpan, Amaun =556802.8528 x $\frac{13}{100}$ = 72384.37	1 1 1 1	2

No.	Penyelesaian	Sub Markah	Jumlah
4	(a) $x^2 + 3(4x + k) = 0$ $x^2 + 12x + 3k = 0$ HTP: $p + 2p = -12$ $p = -4$ HDP: $p(2p) = 3k$ $2(-4)^2 = 3k$ $k = \frac{32}{3}$ (b) HTP: $(p + 1) + (p - 5) = (-4 + 1) + (-4 - 5)$ $= (-3) + (-9)$ $= -12$ HDP: $(p + 1)(P - 5) = (-4 + 1)(-4 - 5)$ $= (-3)(-9)$ =27 Both HTP and HDP correct, $x^2 + 12x + 27 = 0$	1 1 1 1 1 1	6

No.	Penyelesaian	Sub Markah	Jumlah
5	(a)  $sinA = \frac{a}{c}$ and $kos\ A = \frac{b}{c}$ and $\tan A = \frac{a}{b}$ Teorem Pythagoras, $a^2 + b^2 = c^2$..... ① ① $\div c^2$: $\frac{a^2}{c^2} + \frac{b^2}{c^2} = \frac{c^2}{c^2}$ $\left(\frac{a}{c}\right)^2 + \left(\frac{b}{c}\right)^2 = 1$ $sin^2A + kos^2A = 1$ Terbukti. (b)  Graf bentuk sin x diberi 1 markah Semua betul diberi 1 markah	1 1 1 1	

No.	Penyelesaian	Sub Markah	Jumlah
	(c) a=4, b=3,c=1 Betul semua diberi 1 markah.	1	
	 		
	Bentuk graf	1	
	Amplitud	1	
	Kitaran	1	8

No.	Penyelesaian	Sub Markah	Jumlah
6	(a) $\sqrt{(x-5)^2+(y-2)^2} = \sqrt{(x-9)^2+(y-8)^2}$	1	
	$(x-5)^2+(y-2)^2 = (x-9)^2+(y-8)^2$		
	$x^2-10x+25+y^2-4y+4 = x^2-18x+81+y^2-16y+64$	1	
	$2x+3y-29=0$	1	3
	(b) Lokus P memintas titik B sebab rombus, Pada titik B, $(x,0)$ $2x+3(0)-29=0$ $x=14.5$ Maka, titik B ialah (14.5, 0). Katakan titik D ialah (a,b) , 5+9= a+14.5		
	ATAU cari titik D melalui titik tengah a=- 0.5 2+8=b+0 b=10		
	Maka, D =(-0.5, 10)	1	
	Luas rombus $= \frac{1}{2}\begin{vmatrix} 5 & 0 & 9 & -0.5 & 5 \\ 2 & 14.5 & 8 & 10 & 2 \end{vmatrix}$ atau setara		
	Luas rombus $= \frac{1}{2}\lvert(5)(14.5)+(0)(8)+(9)(10)+(-0.5)(2)-(0)(2)-(14.5)(9)-(-0.5)(8)-(5)(10)\rvert$	1	3
	$= 65$ units	1	
	(c) Katakan P=$2x+3y-29$ melalui titik R(10, 2). P= 2(10)+3(2)-29 =-3 $\neq$ 0	1	2
	Maka, Lokus P tidak melalui titik R(10,2).	1	

No.	Penyelesaian	Sub Markah	Jumlah
7	(a) $y = x(x+2)^3$ $\frac{dy}{dx} = x\frac{d}{dx}(x+2)^3 + (x+2)^3\frac{d}{dx}(x)$ $= x\,(3(x+2)^{3-1}(1) + (x+2)^3((1)x^{1-1})$ $= 2(x+2)^2(2x+1)$	1 1	
	(b) Apabila $\frac{dy}{dx} = 0$, $2(x+2)^2(2x+1) = 0$ $x = -2$ both $x = -\frac{1}{2}$ $y = 0$ $y = -\frac{27}{16} // -1.6875$ $P(-2,0)$ $Q(-\frac{1}{2}, -\frac{27}{16})$	1 1 1 1	
	(c) x | -2.1 | -2 | -1.9 $\frac{dy}{dx}$ | -0.064 | 0 | -0.056 Tanda bagi $\frac{dy}{dx}$ | - | 0 | - Lakaran tangen | \ | - | \	1	
	Lakaran graf 		
	$P(-2,0)$ ialah titik lengkok balas.	1	8

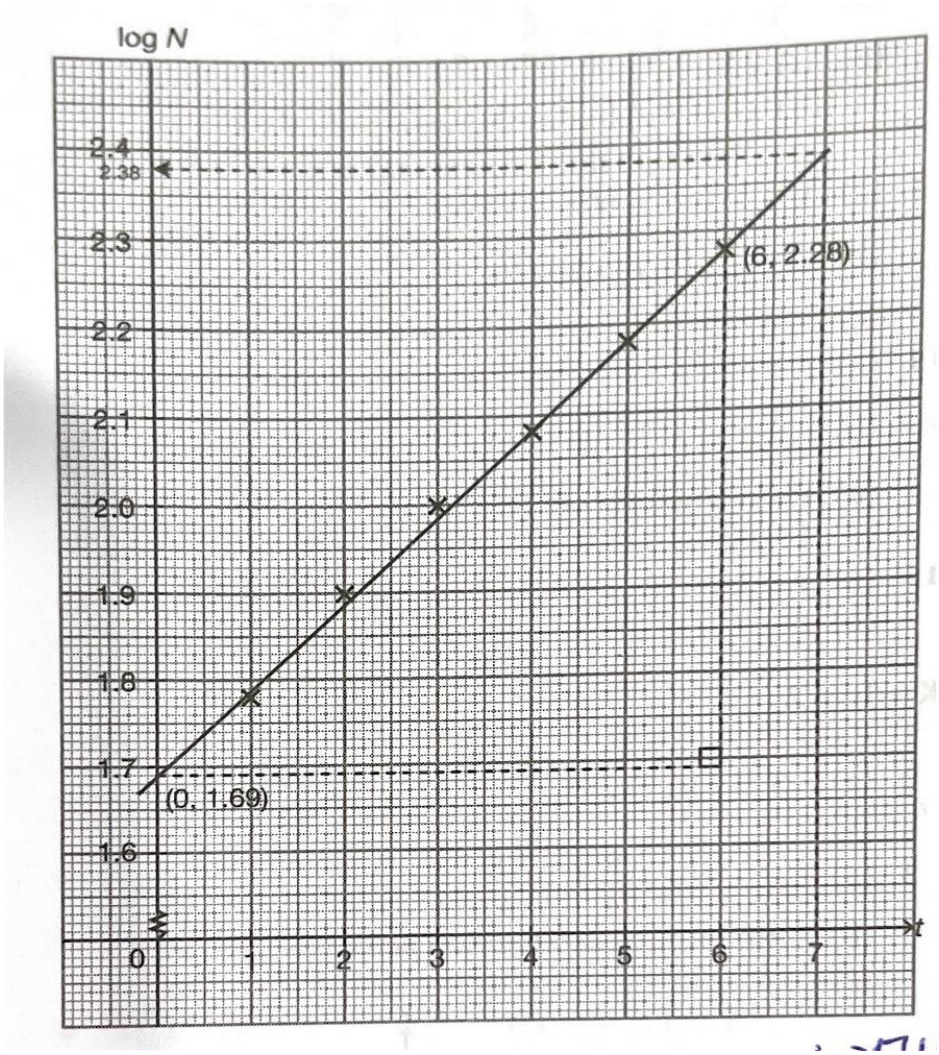
No.	Penyelesaian	Sub Markah	Jumlah
8	(a) Pada titik B, $y = 0$ $x = (0)^2 + 3$ $x = 3$ Maka, titik B ialah (3,0). (b) Luas rantau berlorek R= $\frac{1}{2} \times 4 \times 4 + \int_0^1 x\, dy$ $= \frac{1}{2} \times 4 \times 4 + \int_0^1 (y^2 + 3)\, dy$ $= 8 + \left[\frac{y^3}{3} + 3y\right]_0^1$ $= 8 + \left[\frac{(1)^3}{3} + 3(1) - \left(\frac{(0)^3}{3} + 3(0)\right)\right]$ $= 11\frac{1}{3}$ (c) Isi padu janaan= $\frac{1}{3} \times \pi \times (1)^2 \times 1 + \int_3^4 \pi y^2\ dx$ $= \frac{1}{3} \times \pi \times (1)^2 \times 1 + \int_3^4 \pi(x - 3)\ dx$ $= \frac{1}{3}\pi + \pi\left[\frac{x^2}{2} - 3x\right]_3^4$ $= \frac{1}{3}\pi + \pi\left[\frac{(4)^2}{2} - 3(4) - \left(\frac{(3)^2}{2} - 3(3)\right)\right]$ $= \frac{1}{3}\pi + \frac{1}{2}\pi$ $= \frac{5}{6}\pi$	1 1 1 1 1 1 1 1 1 1	10

No.	Penyelesaian	Sub Markah	Jumlah
9	(a) (i) $\overrightarrow{DB} = \overrightarrow{DA} + \overrightarrow{AB}$	1	
	$= -5\overrightarrow{AE} + \underset{\sim}{x}$		
	$= \underset{\sim}{x} - 5\underset{\sim}{y}$	1	
	(ii) $\overrightarrow{AF} = \overrightarrow{AB} + \overrightarrow{BF}$	1	
	$= \underset{\sim}{c} + \frac{1}{5}(-\underset{\sim}{x} + 5\underset{\sim}{y})$	1	
	$= \frac{4}{5}\underset{\sim}{x} + \underset{\sim}{y}$	1	
	(b) $\overrightarrow{DC} = m\,x - y$		
	$\overrightarrow{AC} = \overrightarrow{AD} + \overrightarrow{DC}$		
	$\overrightarrow{AC} = 5y + mx - y$		
	$= mx + 4y$	1	
	$\overrightarrow{AF} = n\overrightarrow{AC}$		
	$\frac{4}{5}x + y = n(mx + 4y)$	1	
	$\frac{4}{5}x + y = mnx + 4ny$		
	Bandingkan x dan y	1	
	$1 = 4n$		
	$n = \frac{1}{4}$		
	$\frac{4}{5} = mn$	1	
	$\frac{4}{5} = m(\frac{1}{4})$		
	$m = \frac{16}{5}$	1	10

No.	Penyelesaian	Sub Markah	Jumlah
10	(a)		

Masa/Times, t (hari/days)	1	2	3	4	5
$log_{10}N$	1.78	1.90	2.0	2.08	2.18

1



Plot log N melawan t (skala seragam dan paksi betul) 1m — 1

6 titik diplot dengan betul 2m — 1

5 atau 4 titik diplot betul 1m — 1

Garis lurus terbaik 1m — 1

b) i)

$N = Ar^t$

$log_{10}N = log_{10}A + tlog_{10}r$

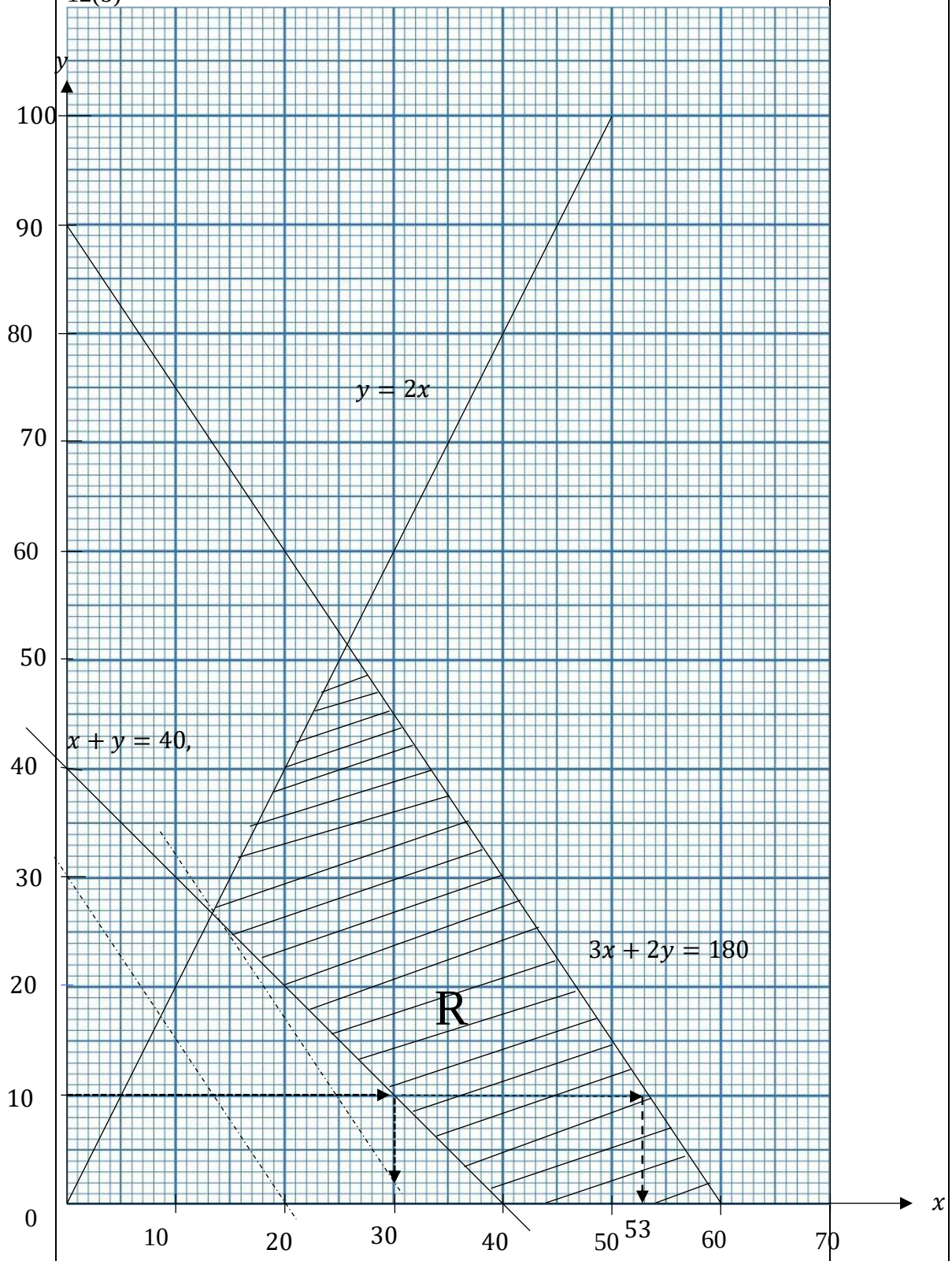
$log_{10}N = tlog_{10}r + log_{10}A$ (1m)

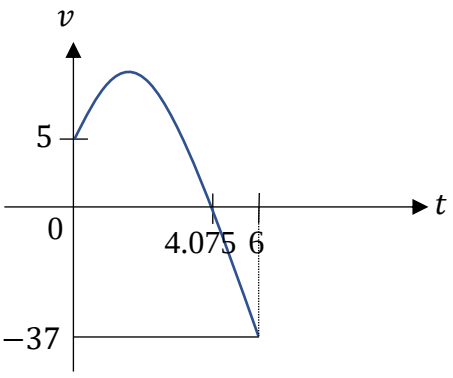
$log_{10}A = y\ intercept$

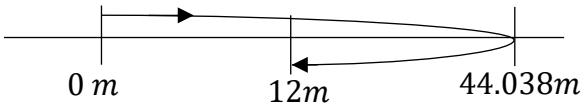
No.	Penyelesaian	Sub Markah	Jumlah
	$log_{10}A = 1.69$ $A = 48.98$ (1m) $log_{10}r = gradient$ $= \frac{2.28-1.69}{6-0}$ = 0.0983 (1m) r = 1.254 (1m) c) when t = 7, $log_{10}N = 2.38$ N = 239 (1m)		10

No.	Penyelesaian	Sub Markah	Jumlah
11	(a) (i)		
	$P(X = 3) = {}^{8}C_{3}(0.1)^{3}(0.9)^{5}$	1	
	$= 0.03307$	1	
	(ii) $P(X > 5) = P(X = 6) + P(X = 7) + P(X = 8)$	1	
	$= {}^{8}C_{6}(0.9)^{6}(0.1)^{2} + {}^{8}C_{7}(0.9)^{7}(0.1)^{1} + {}^{8}C_{8}(0.9)^{8}(0.1)^{0}$	1	
	$=0.9619$	1	
	(b) (i) $P(X > 35)$		
	$= P\left(Z > \frac{35-25}{8}\right)$	1	
	$= P(z > 1.25)$		
	$= 0.1056$	1	
	(ii) $\frac{100}{600} = 0.1667$		
	$P(X < t) = 0.1667$		
	$P\left(Z < \frac{t-25}{8}\right) = 0.1667$	1	
	$\frac{t-25}{8} = -0.967$	1	
	$t = 17.264$	1	10

No.	Penyelesaian	Sub Markah	Jumlah
12	(a) $x + y \geq 40,$	1	
	$y \leq 2x,$	1	
	$3x + 2y \leq 180$	1	
	(b) Rujuk graf		
	Lukis sekurang-kurangnya satu garis lurus betul (1 M)	1	
	Lukis semua garis lurus betul (1 M)	1	
	Lorekkan rantau R dengan betul (1M)	1	
	(c) (i) Daripada graf,		
	$x_{minimum} = 30,$	1	
	$x_{maksimum} = 53$	1	
	(ii)		
	$k = 120x + 80y$		
	Daripada graf, (14,26) untuk titik minimum		
	$k = 120(14) + 80(26)$	1	
	= 3760	1	10

No.	Penyelesaian	Sub Markah	Jumlah
	12(b) 		

No.	Penyelesaian	Sub Markah	Jumlah
13	(a) $a = 11 - 6t$ $v = \int 11 - 6t \, dt$ $v = 11t - \frac{6t^2}{2}$+c $v = 11t - 3t^2$+c Pada masa $t = 0, v = 5$, $5 = 11(0) - 3(0)^2$+c $5 =$c Maka, $v = 11t - 3t^2$+5 (b) $v = 11(6) - 3(6)^2$+5 $v = -37$  Bentuk parabola ∩ 1 markah Titik (0,5), (4.075,0) dan (6,-37) diberi 1 markah. (c) (i) $s = \int 11t - 3t^2 + 5 \, dt$ $s = \frac{11}{2}t^2 - \frac{3t^3}{3} + 5t + c$ Pada masa $t = 0, s = 0$, $s = 0$ Maka, $s = \frac{11}{2}t^2 - t^3 + 5t$ Apabila $t = 6$, $s = \frac{11}{2}(6)^2 - (6)^3 + 5(6)$ $s = 12$	1 1 1 1 1 1 1 1	

No.	Penyelesaian	Sub Markah	Jumlah
	(ii) Apabilia $t = 4.075$, $s = \frac{11}{2}(4.075)^2 - (4.075)^3 + 5(4.075)$ $= 44.038$	1	
	 		
	$t = 0$ $t = 6$ $t = 4.075$ Jumlah jarak $= 44.038 + (44.038 - 12)$	1	
	$= 76.076\ m$	1	10
	Kaedah 2: $Jumlah\ jarak = \int_0^{4.075} 11t - 3t^2 + 5\ dt + \left\lvert \int_{4.075}^{6} 11t - 3t^2 + 5\ dt \right\rvert$		
	$= \left[\frac{11}{2}t^2 - t^3 + 5t\right]_0^{4.075} + \left\lvert \left[\frac{11}{2}t^2 - t^3 + 5t\right]_{4.075}^{6} \right\rvert$	1	
	$= \frac{11}{2}(4.075)^2 - (4.075)^3 + 5(4.075) - \frac{11}{2}(0)^2 - (0)^3 + 5(0) + \left\lvert \frac{11}{2}(6)^2 - (6)^3 + 5(6) - \left(\frac{11}{2}(4.075)^2 - (4.075)^3 + 5(4.075)\right) \right\rvert$	1	
	$=44.038+\lvert -32.038 \rvert$	1	
	$=76.076$		

No.	Penyelesaian	Sub Markah	Jumlah
14	(a) $s = \frac{5.3 + 4.6 + 7.4}{2}$ $= 8.65\ cm$	1	
	$Luas\ PQR = \sqrt{8.65(8.65 - 5.3)(8.65 - 4.6)(8.65 - 7.4)}$ $= 12.1119$ =12.11 cm	1 1	
	(b) $(7.4)^2 = (5.3)^2 + (4.6)^2 - 2(5.3)(4.6)kos\angle PQR$ $\angle PQR = 96.49°$	1 1	
	$\angle PSR = 108° - 96.49°$ $= 83.51°$	1	
	(c) $\angle SPR = 180° - 83.51° - 60°$ $= 36.49°$		
	$\frac{PS}{sin36.49°} = \frac{7.4}{sin83.51°}$	1	
	$PS = 4.429\ cm$ $Luas\ PRS = \frac{1}{2}(7.4)(4.429)\sin 60°$ $= 14.19$	1	
	Luas sisi empat PQRS = 12.11 + 14.19 =26.30	1 1	10

No.	Penyelesaian	Sub Markah	Jumlah
15 (a)	Menggunakan formula $I_{17/14} = \frac{P_{17}}{P_{14}} \times 100$	K1	
	p =125	N1	
	q = 48.00	N1	
	r = 20.00	N1	4
(b)	$\bar{I}_{17/14} = \frac{125 \times 12 + 120 \times 14 + 90 \times 10 + 115 \times 4}{12 + 14 + 10 + 4}$	K1	2
	= 113.5	N1	
(c)	Komoditi B: $I_{21/14} = 156$	P1	
	Komoditi D: $I_{\frac{21}{14}} = 103.5$	P1	4
	$\bar{I}_{21/14} = \frac{125 \times 12 + 156 \times 14 + 90 \times 10 + 103.5 \times 4}{12 + 14 + 10 + 4}$	K1	
	= 124.95	N1	